IEI Technology Corp.

MODEL:

IBX-650B

Intel® ULV Celeron® M Fanless Embedded System

COM Ports, USB 2.0, IDE Hard Drive, RoHS Compliant

User Manual

Rev. 2.00 – 4 November, 2010

RoHS Lead Free

Revision

Date	Version	Changes
4 November, 2010	2.00	Updated for R20 version
1 August, 2007	1.00	Initial release

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Precautions

SAFETY PRECAUTIONS

1. Prior to installing, moving and modifying the embedded system, make sure that the unit's power is turned off and the power cord is disconnected.
2. Do not apply voltage levels that exceed the specified voltage range. Doing so may cause fire or an electrical shock.
3. Electric shock can occur if the embedded system is opened. Do not drop or insert any objects into any openings of the embedded system.
4. Only qualified engineers from certified system integrators or VARs are allowed to make necessary modifications to the embedded system.
5. If considerable amounts of dust, water, or fluids enter the embedded system, turn off the power supply immediately, unplug the power cord, and contact the vendor.
6. Explosions may occur with installations in environments where flammable gases are present.
7. Fault-tolerant and failsafe designs should be implemented with the use of the embedded system on transportation vehicles, ships, safety/security devices, or medical devices not related to life-support functions. Users/integrators should take responsibility for adequate levels of reliability and safety.
8. Preventive designs should be implemented so as to avoid communications faults between the embedded system and the devices it controls.

HANDLING PRECAUTIONS

1. Do not drop the embedded system against a hard surface.
2. Do not strike or exert excessive force onto the embedded system.
3. Avoid exposing the embedded system to direct sunlight, dust, or chemical vapors.
4. Condensation might form inside the embedded system chassis if exposed to sudden changes in temperature.
5. Carefully route the power cord so that people cannot step on it. Do not place anything over the power cord.

6. If the equipment should be left unused for an extended period of time, disconnect it from the power source to avoid damage by transient over-voltage.
7. If any of the following situations arises, get the equipment checked by service personnel:
   - The power cord or plug is damaged.
   - Liquid has penetrated into the equipment.
   - The equipment has been exposed to moisture.
   - The equipment does not work properly, or the user cannot get it to work according to the user manual.
   - The equipment has been dropped and damaged.
   - The equipment shows obvious signs of breakage.

WARNING!

Any changes or modifications made to the equipment that are not expressly approved by the relevant standards could void the authority to operate the equipment.

MAINTENANCE AND CLEANING

Note the following precautions before beginning to clean the embedded system.

When cleaning any single part or component of the computer, please read and understand the details below fully.

- Never spray or squirt liquids directly onto any computer component. To clean the device, please rub it with a piece of dry and soft cloth or a slightly moistened cloth.
- The interior of the embedded system does not require cleaning. Keep fluids away from the embedded system and the interior of it.
- Turn the system off before cleaning the embedded system.
- Never drop any objects through the openings of the embedded system or get the circuit board damp or wet.

- Be cautious of any cleaning solvents or chemicals used when cleaning the embedded system as some individuals may be allergic to the ingredients.
- Avoid any eating, drinking or smoking near the embedded system.

CLEANING TOOLS

Below is a list of items to use while cleaning the computer or computer peripherals. Please keep in mind that some components in the computer may only be cleaned using a product designed for cleaning that component, if this is the case it will be mentioned in the cleaning tips.

- ***Cloth*** - A piece of cloth is the best tool to use when rubbing up a component. Although paper towels or tissues can be used on most hardware as well, it is recommended to rub it with a piece of cloth.
- ***Water or rubbing alcohol*** – Moisten a piece of cloth a bit with some water or rubbing alcohol and rub it on the computer. Unknown solvents may be harmful to the plastics parts.
- ***Vacuum cleaner*** - Removing the dust, dirt, hair, cigarette particles, and other particles out of a computer can be one of the best methods of cleaning a computer. Over time these items can restrict the airflow in a computer and cause circuitry to corrode.
- ***Cotton swabs*** - Cotton swabs moistened with rubbing alcohol or water are excellent tools for wiping hard to reach areas in the keyboard, mouse, and other locations.
- ***Foam swabs*** - Whenever possible it is better to use lint free swabs such as foam swabs.

ESD PRECAUTIONS

Observe all conventional anti-ESD methods while handling the components contained within the embedded system should the need arise to remove any of the chassis panels. The use of a grounded wrist strap and an anti-static work pad is recommended. Avoid dust and debris or other static-accumulating materials in the work area.

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Chapter

1

Introduction

1.1 IBX-650B Embedded System Overview

Figure 1-1: IBX-650B Embedded System

IBX-650B is an Intel® Celeron® M based embedded solutions with IEI Enano-8523T motherboard. The fanless motherboard has been optimized for multimedia applications that require minimum installation space. The Enano-8523T motherboard supports a full range of functions for an AT/ATX-compatible industrial computer. IBX-650B embedded subsystem is capable of supporting one 2.5” hard disk drive.

1.1.1 IBX-650B Benefits

The IBX-650B embedded system has the following benefits:

- Easy installation saves installation time
- Complete integration saves solution development time and cost
- Secure storage with one IDE hard drive supported
- Compact size saves space
- Powerful preinstalled Intel® Celeron M CPU and motherboard ensures rigorous processing needs can be met

1.1.2 IBX-650B Features

The IBX-650B has the following features

- RoHS compliant design
- Fanless system
- Built-in DC-to-DC power converter
- Intel® Celeron M 1GHz Zero Cache CPU supported

- One 10/100Base-T Ethernet connector for network applications
- One IDE hard drive supported
- Wall mount and DIN mount supported.

1.2 Technical Specifications

The specifications for the Intel based embedded systems are listed below.

	IBX-650B
CPU	Intel® ULV Celeron® M 1GHz zero cache CPU
System Chipset	Intel® 852GM + ICH4
System Memory	512MB 200-pin SO-DIMM DDR SDRAM preinstalled
Ethernet	One 10/100Base-T Intel 82562ET
Display	CRT integrated in Intel® 852GM
IO	4 x USB 2.0 supported (two in front panel, two in rear panel) 3 x RS-232 3 x Audio jacks (Line-In, Line-Out, MIC) 1 x Parallel port 1 x VGA connector 1 x RJ-45 Ethernet connector 1 x Keyboard connector 1 x Mouse connector
Storage	One 2.5” IDE hard drive supported One CompactFlash® card slot supported
Chassis Construction	Aluminum
Power Supply	Internal DC-to-DC power converter, input voltage: 12V DC External power adapter, input voltage: 90V AC ~ 264V AC @ 47Hz ~ 63Hz, 55W

Operating Shock	Operating Shock Half-Sine Wave Shock 3G: 11ms: 3 shocks per axis: Vertical/Transverse/Longitudinal. Non-Operation Shock Half-Sine Wave Shock 10G: 11ms: 3 shocks per axis: Vertical/Transverse/Longitudinal.
Operating Vibration	1G, 5Hz~500Hz, random operation (HDD)
Operating temperature	0ºC ~ 50ºC
Color	Black
Weight (Net)	2.75kg
Dimensions (D x W x H)	170mm x 210.2mm x 68.75mm
EMC	UL / CE/ EMC / FCC

Table 1-1: Technical Specifications

1.3 Power Module Specifications

The IDD-12250A power module installed in the IBX-650B embedded system supports a 12V DC input. The specifications for the IDD-12250A are shown in **Table 1-2**.

Model Name:	**IDD-12250A**
Input	12VDC
Output	
12V	5A (pass thru.)
5V	10A (Max.)
5VSB	0.5A (Max.)
Max. Total Output:	50W+60W (12V pass thru.)
Performance Characteristics	
Noise & Ripple:	< 25mV
Load Regulation	<120mV

Efficiency:	Up to 90%
Dimensions:	40mm x 100mm
Weight:	46g
Operating Temperature:	0°C~70°C

Table 1-2: DC-to-DC Power Module Specifications

1.4 Power Adapter

The IBX-650B series models are shipped with a 60W power adapter.

Figure 1-2: Power Adapter

The specifications for the adapter are listed in **Table 1-3**:

Input Voltage	90 V ~ 264 V AC
Input Frequency	47 Hz ~ 63 Hz
Output Voltage	12 V
Output Current	5 A
Efficiency	87%
Operating Temperature	0 ºC ~ 40 ºC
Storage Temperature	-20 ºC ~ 65 ºC

Table 1-3: Power Adapter Specifications

Chapter

2

Mechanical Description

2.1 IBX-650B Mechanical Overview

The IBX-650B RoHS compliant, Intel® Celeron® M fanless embedded system features industrial grade components that offer longer operating life, high vibration resistance and endurance over a wide temperature range. The IBX-650B combines these features in an aluminum enclosure designed for space critical applications that require low power consumption. Featuring four USB, three serial communication ports, three audio jacks, as well as LAN, parallel port, keyboard, mouse and VGA, the IBX-650B offers system integrators and developers the best selection of robust and high performance computing system platforms. An internal bracket supports one 2.5" IDE hard drives.

2.2 Physical Dimensions

The physical dimensions of the IBX-650B embedded systems are listed below.

2.2.1 IBX-650B Dimensions

The dimensions of the IBX-650B are listed below and shown in **Figure 2-1**.

- **Height**: 68.75mm
- **Width**: 210.20mm
- **Length**: 170.00mm

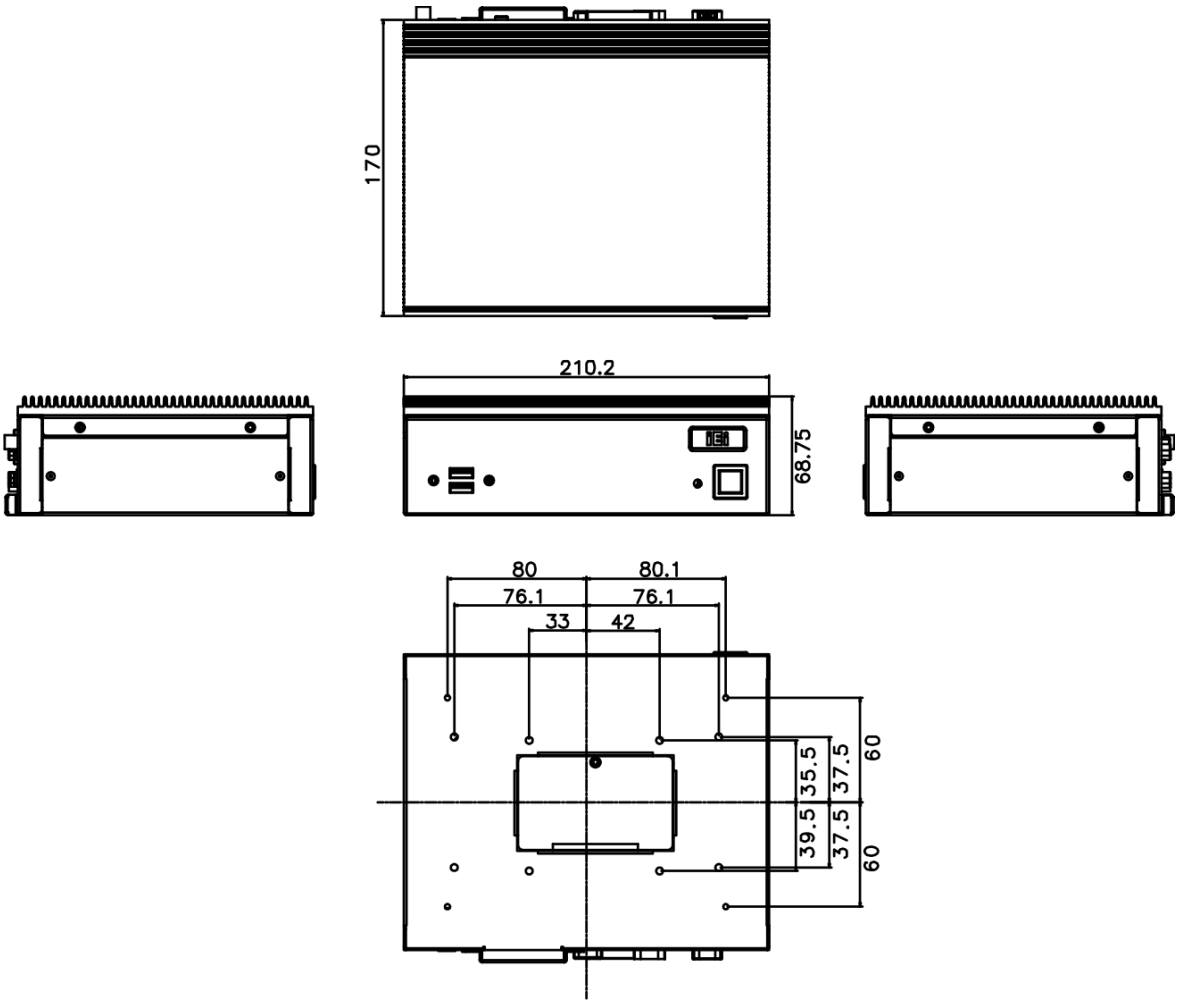


Figure 2-1: IBX-650B Dimensions (mm)

2.2.2 Motherboard Dimensions

The Enano-8523T motherboard dimension are listed below and shown in **Figure 2-2**.

- **Length**: 115.00mm
- **Width**: 165.00mm

Figure 2-2: Enano-8523T SBC Dimensions (mm)

2.2.3 Power Module Dimensions

The power module dimensions are listed below and shown in **Figure 2-3**.

- **Length**: 100.00mm
- **Width**: 40.00mm

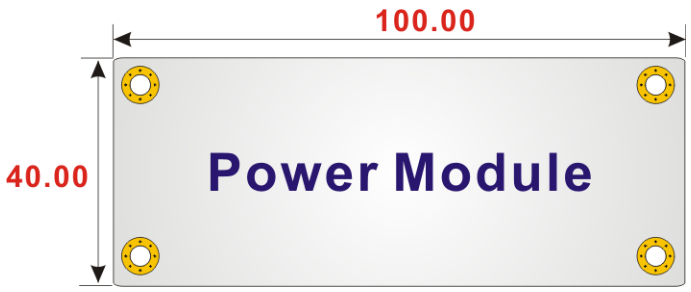


Figure 2-3: Power Module Dimensions (mm)

2.3 External Overview

2.3.1 Front Panel

The IBX-650B front panel contains:

- 2 x USB port connectors
- 1 x HDD LED indicator
- 1 x Power button

An overview of the front panel is shown in **Figure 2-4** below.

Figure 2-4: IBX-650B Front Panel

2.3.2 Rear Panel

The rear panel of the IBX-650B provides access to the following external I/O connectors.

- 3 x RS-232 serial ports
- 1 x Parallel port
- 1 x VGA connector
- 1 x RJ-45 Ethernet connector
- 2 x USB port connectors
- 3 x Audio jacks
- 1 x Keyboard connector
- 1 x Mouse connector
- 1 x 12V DC power jack
- 1 x Reset button

An overview of the rear panel is shown in **Figure 2-5**.

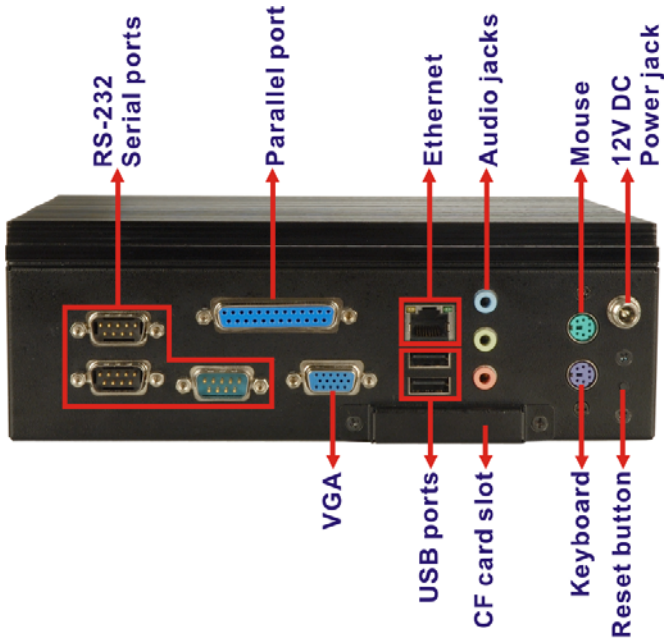


Figure 2-5: IBX-650B Rear Panel

2.3.3 Bottom Surface

WARNING:

Never remove the bottom access panel from the chassis while power is still being fed into the system. Before removing the bottom access panel, make sure the system has been turned off and all power connectors unplugged.

The bottom surface of the IBX-650B contains the retention screw holes for the VESA MIS-D 75 wall-mount kit, the DIN mount bracket and four foot pads. The SO-DIMM socket access panel is also located on the bottom surface. The SO-DIMM socket access panel is secured to the IBX-650B with one retention screw.

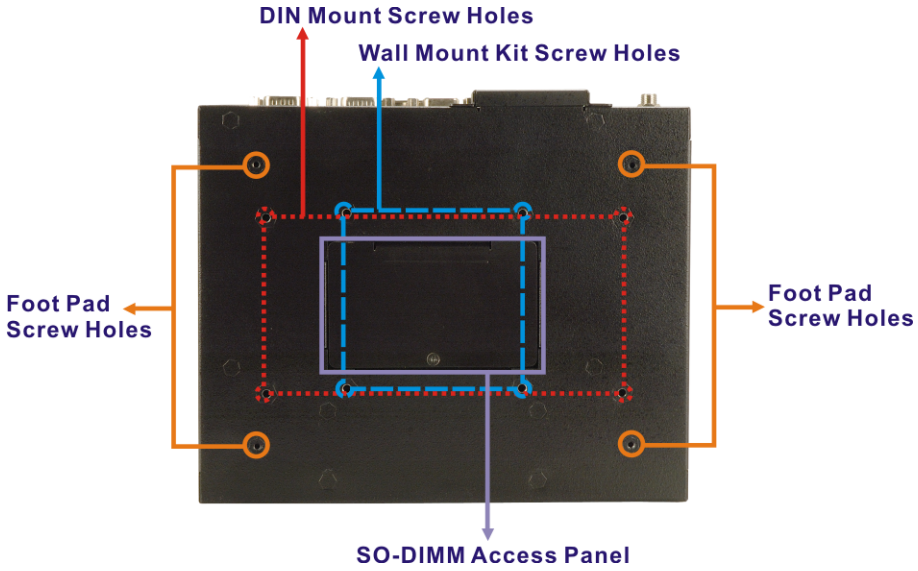


Figure 2-6: Bottom Surface

2.4 Internal Overview

The IBX-650B internal components are listed below:

- 1 x IEI Enano-8523T motherboard (preinstalled)
- 1 x IEI IDD-12250A power module (preinstalled)
- 1 x SO-DIMM module (preinstalled)
- 1 x Hard drive bracket and IDE cable support one IDE hard disk

Except for the SO-DIMM module, all the components are accessed by removing the top cover. The SO-DIMM module is accessed through the access panel on the bottom surface.

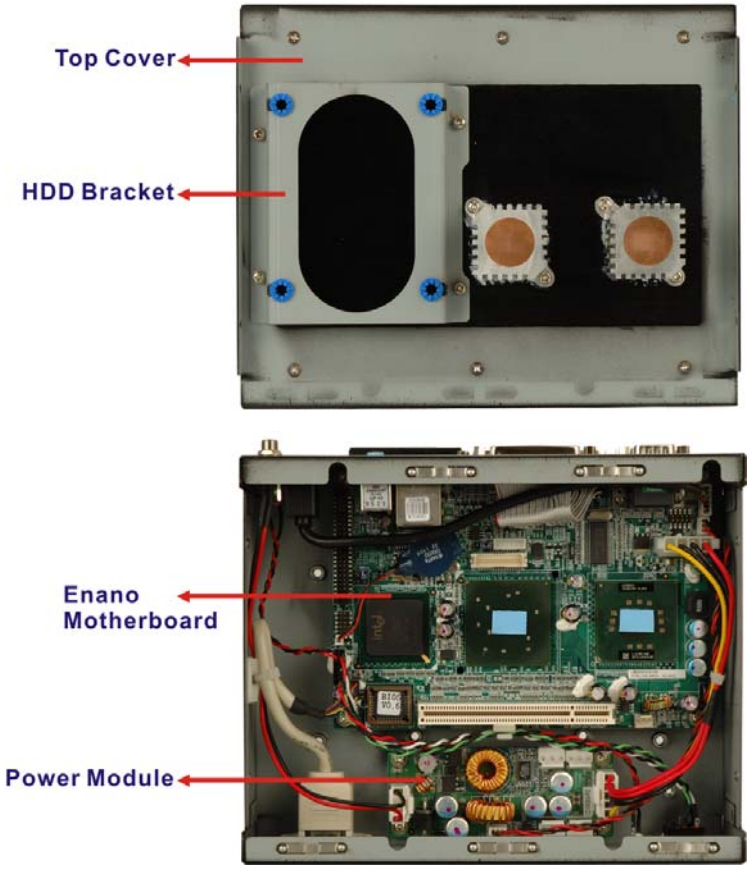


Figure 2-7: Internal Overview

Chapter

3

System Components

3.1 IBX-650B Embedded System Motherboard

3.1.1 IBX-650B Embedded System Motherboard

NOTE:

The jumpers and connectors shown in the section below are those jumpers and connectors that are relevant to the configuration and installation of the embedded system. For a complete list of jumpers and connectors on the Enano-8523T motherboard, please refer to the Enano-8523T user manual.

The IBX-650B models have an Enano-8523T motherboard installed in the system. The following sections describe the relevant connectors and jumpers on the motherboard.

3.1.2 Enano-8523T Motherboard Overview

The locations of the Enano-8523T jumpers and connectors used on the IBX-650B are shown in **Figure 3-1** below.

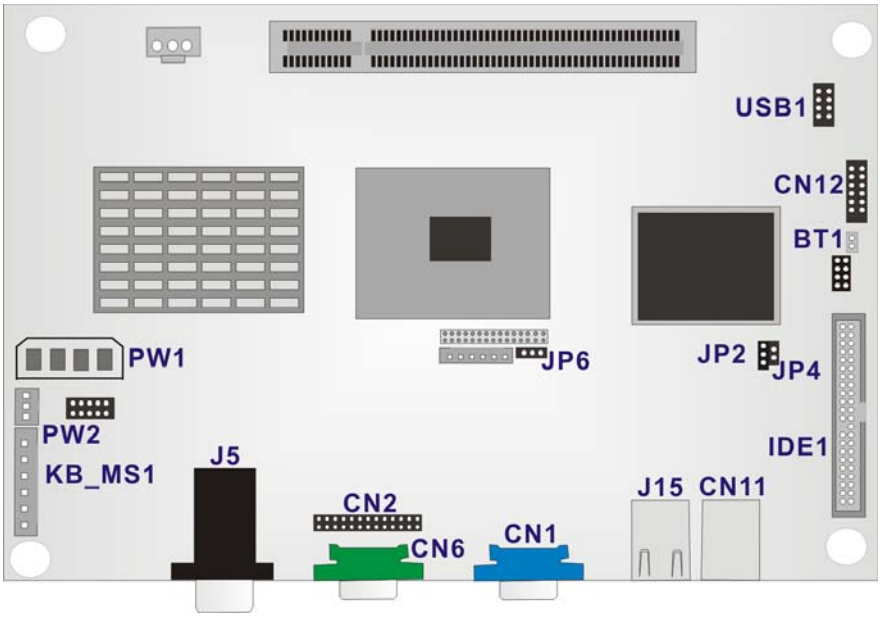


Figure 3-1: Enano-8523T Jumper and Connector Locations

3.1.3 CPU Support

NOTE:

The IBX-650B has a preinstalled 1GHz Celeron M CPU on-board. If the CPU fails, the motherboard has to be replaced. Please contact the IEI reseller or vendor you purchased the IBX-650B from or contact an IEI sales representative directly. To contact an IEI sales representative, please send an email to sales@iei.com.tw.

The ULV Intel® Celeron® M processor is installed on the Enano-8523T motherboard. Specifications for the processor are listed in **Table 3-1** below:

Family	Architecture	Cache	Clock Speed	FSB
ULV Intel® Celeron® M	90 nm	512 KB L2	1.0 GHz	400 MHz

Table 3-1: Supported Processor

3.1.4 Intel® Celeron® M

The (ULV) Intel® Celeron® M processor comes with the following features:

- Intel® Streaming SIMD Extensions accelerates 3D graphics performance, video decoding/encoding, and speech recognition.
- Advanced power management features
- Compatible with IA-32 software
- Advanced branch prediction and data prefetch logic

3.2 Peripheral Interface Connectors

Section 3.2.1 lists all the peripheral interface connectors seen in Section 3.1.2.

3.2.1 Peripheral Interface Connectors

Table 3-2 shows a list of the peripheral interface connectors on the Enano-8523T. Detailed descriptions of these connectors can be found in **Section 3.3**.

Label	Connector	Type
ATX power connector	3-pin wafer connector	PW2
Battery connector	2-pin wafer connector	BT1
CF Card Type II connector (solder side)	50-pin CF slot	CN7
Front panel connector	12-pin header	CN12
HDD connector	44-pin box header	IDE1
Keyboard/Mouse connector	6-pin wafer connector	KB_MS1
Parallel port connector	26-pin header	CN2
Power connector	4-pin wafer connector	PW1
SO-DIMM slot (solder side)	200-pin slot	DIMM1
USB 2.0 connector for two USB devices	8-pin header	USB1

Table 3-2: Peripheral Interface Connectors

3.2.2 External Interface Panel Connectors

Table 3-3 lists the rear panel connectors on the Enano-8523T. Detailed descriptions of these connectors can be found in **Section 3.4**.

Connector	Type	Label

Audio connector	Audio jack	CN11
Ethernet connectors Two USB ports	RJ-45 connector USB port	J15
COM1 and COM2 serial port connector	DB-9 connector	J5
COM3 serial port connector	DB-9 connector	CN6
VGA port connector	15-pin female	CN1

Table 3-3: Rear Panel Connectors

3.3 Internal Peripheral Connectors

Internal peripheral connectors are found on the motherboard and are only accessible when the motherboard is outside of the chassis. This section has complete descriptions of all the internal, peripheral connectors on the Enano-8523T.

3.3.1 ATX Power Connector

CN Label: PW2

CN Type: 3-pin wafer connector (1x3)

CN Location: See Figure 3-2

CN Pinouts: See Table 3-4

PIN NO.	DESCRIPTION
1	5VSBY
2	GND
3	PSON

Table 3-4: ATX Power Connector Pinouts

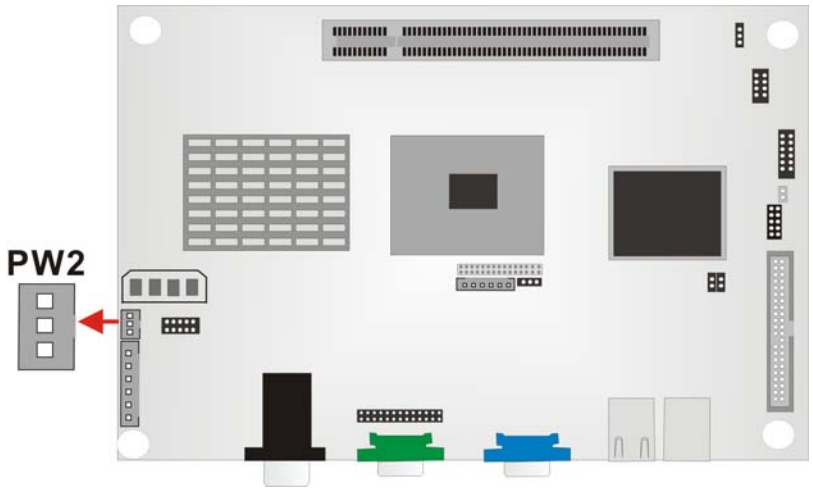


Figure 3-2: ATX Power Connector Location

3.3.2 Battery Connector

CN Label:	BT1
CN Type:	2-pin wafer connector (1x2)
CN Location:	See Figure 3-3

The battery connector is connected to a preinstalled VARTA CR2032 3V battery.

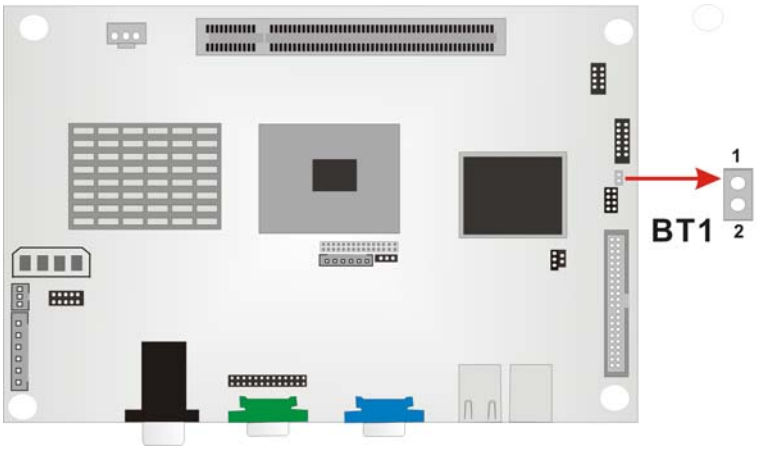


Figure 3-3: Battery Connector Location

3.3.3 Compact Flash Type 2 Socket

CN Label: CN7

CN Type: 50-pin CF slot

CN Location: See Figure 3-4

CN Pinouts: See Table 3-5

A CFII (CompactFlash® type II connector) is located on the rear side of the Enano-8523T. The CFII connector is for applications without external storage. The Compact Flash socket provides an alternative to hard disk drives in applications where hard disk drives may consume too much space and storage capacity is not a requirement. The CF card behaves like a Secondary IDE Master disk drive.

PIN	DESCRIPTION	PIN	DESCRIPTION
1	GROUND	26	VCC-IN CHECK1
2	DATA 3	27	DATA 11
3	DATA 4	28	DATA 12
4	DATA 5	29	DATA 13
5	DATA 6	30	DATA 14
6	DATA 7	31	DATA 15
7	HDC_CS0#	32	HDC_CS1
8	N/C	33	N/C
9	GROUND	34	IOR#
10	N/C	35	IOW#
11	N/C	36	VCC_COM
12	N/C	37	IRQ15
13	VCC_COM	38	VCC_COM
14	N/C	39	CSEL
15	N/C	40	N/C
16	N/C	41	HDD_RESET
17	N/C	42	IORDY
18	SA2	43	SDREQ
19	SA1	44	SDACK#

20	SA0	45	HDD_ACTIVE#
21	DATA 0	46	66DET
22	DATA 1	47	DATA 8
23	DATA 2	48	DATA 9
24	N/C	49	DATA 10
25	VCC-IN CHECK2	50	GROUND

Table 3-5: CFII Socket Pinouts

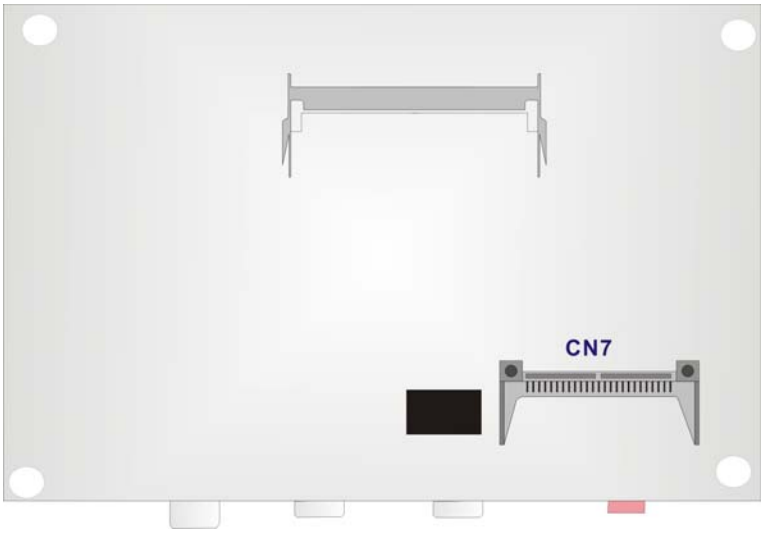


Figure 3-4: CFII Socket Location (Rear Side)

3.3.4 Front Panel Connector

CN Label: CN12

CN Type: 12-pin header (2x6)

CN Location: See Figure 3-5

CN Pinouts: See Table 3-6

The system panel connector connects to:

- the system chassis front panel LEDs
- the chassis speaker
- the power switch

- the reset button.

PIN	DESCRIPTION	PIN	DESCRIPTION
1-3	POWER LED	2-8	SPEAKER
5-7	PWR BUTTON	10-12	RESET
9-11	HDLED		

Table 3-6: Front Panel Connector Pinouts

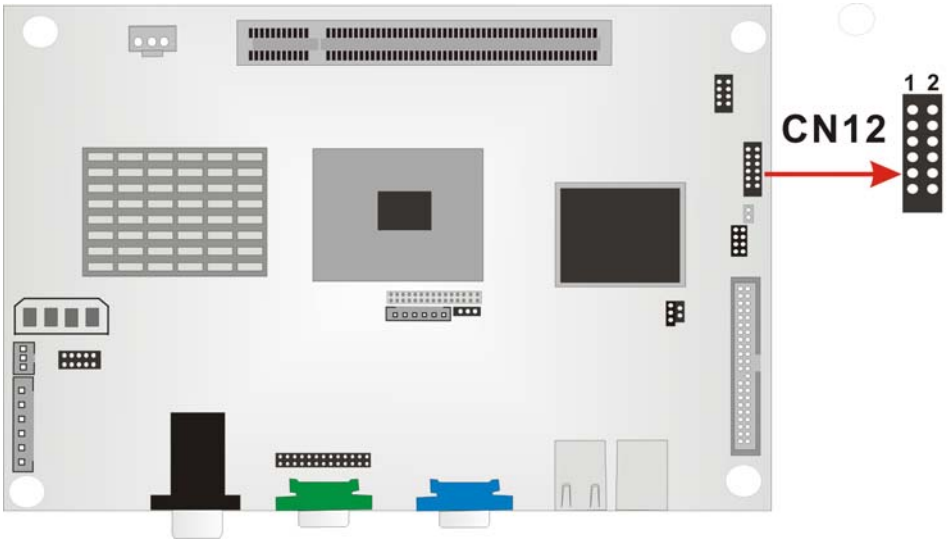


Figure 3-5: Front Panel Connector Location

3.3.5 IDE Connector

CN Label: IDE1

CN Type: 44-pin box header (2x22)

CN Location: See Figure 3-6

CN Pinouts: See Table 3-7

One IDE connector provides connectivity for two IDE devices.

PIN	DESCRIPTION	PIN	DESCRIPTION
1	RESET#	2	GROUND
3	DATA 7	4	DATA 8

5	DATA 6	6	DATA 9
7	DATA 5	8	DATA 10
9	DATA 4	10	DATA 11
11	DATA 3	12	DATA 12
13	DATA 2	14	DATA 13
15	DATA 1	16	DATA 14
17	DATA 0	18	DATA 15
19	GROUND	20	N/C
21	IDE DRQ	22	GROUND
23	IOW#	24	GROUND
25	IOR#	26	GROUND
27	IDE CHRDY	28	GROUND
29	IDE DACK	30	GROUND–DEFAULT
31	INTERRUPT	32	N/C
33	SA1	34	N/C
35	SA0	36	SA2
37	HDC CS0#	38	HDC CS1#
39	HDD ACTIVE#	40	GROUND
41	VCC	42	VCC
43	GROUND	44	N/C

Table 3-7: IDE Connector Pinouts

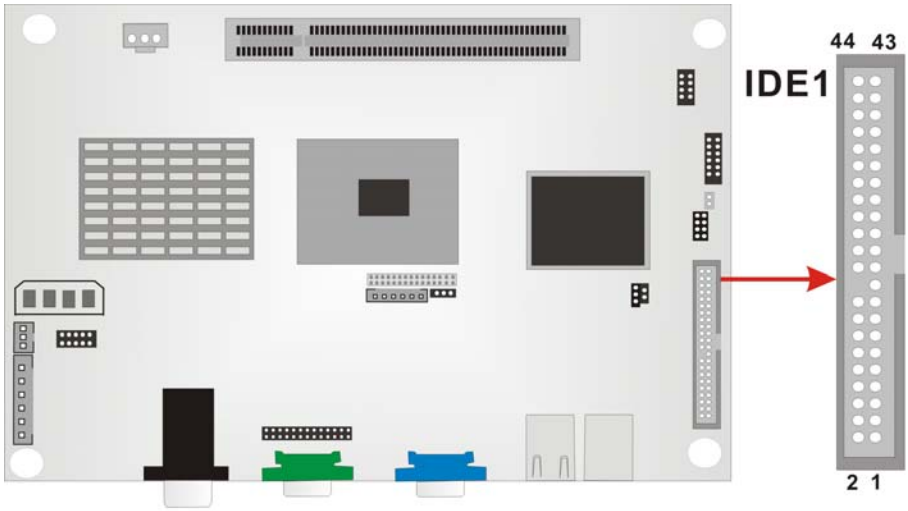


Figure 3-6: IDE Connector Location

3.3.6 Keyboard/Mouse Connector

CN Label:	IR1
CN Type:	6-pin wafer connector (1x6)
CN Location:	See Figure 3-7
CN Pinouts:	See Table 3-8

The Keyboard/ PS2 mouse cable that was shipped with the Enano-8523T board is connected to the keyboard/mouse connector.

PIN	DESCRIPTION
1	5V
2	MS DATA
3	MS CLK
4	KB DATA
5	KB CLK
6	GND

Table 3-8: Keyboard/Mouse Connector Pinouts

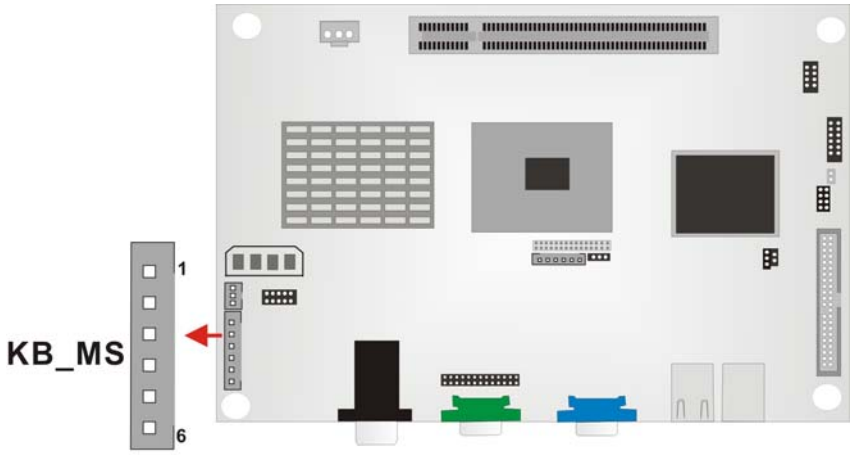


Figure 3-7: Keyboard/Mouse Connector Location

3.3.7 Parallel Port Connector

CN Label: LPT

CN Type: 26-pin header (2x13)

CN Location: See Figure 3-8

CN Pinouts: See Table 3-9

The parallel port connector is usually connected to a printer. A 26-pin flat-cable connector is used to connect the parallel port with a printer or other parallel communication device.

PIN	DESCRIPTION	PIN	DESCRIPTION
1	STROBE#	14	AUTO FORM FEED #
2	DATA0	15	ERROR#
3	DATA1	16	INITIALIZE#
4	DATA2	17	PRINTER SELECT LN#
5	DATA3	18	GND
6	DATA4	19	GND
7	DATA5	20	GND
8	DATA6	21	GND
9	DATA7	22	GND
10	ACKNOWLEDGE#	23	GND

11	BUSY	24	GND
12	PAPER EMPTY	25	GND
13	PRINTER SELECT		

Table 3-9: Parallel Port Connector Pinouts

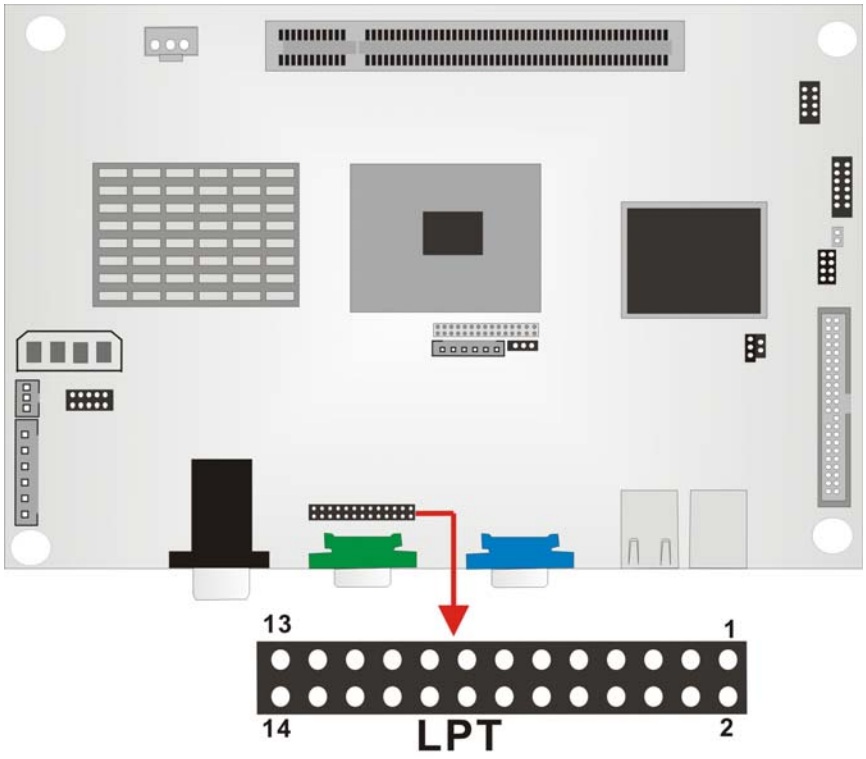


Figure 3-8: Parallel Port Connector Location

3.3.8 Power Connector

CN Label: PW1

CN Type: 4-pin wafer connector (1x4)

CN Location: See Figure 3-9

CN Pinouts: See Table 3-10

Connects a power source from an Enano-8523T to a power module.

PIN	DESCRIPTION
1	5V
2	GND
3	GND
4	12V

Table 3-10: Power Connector Pinouts

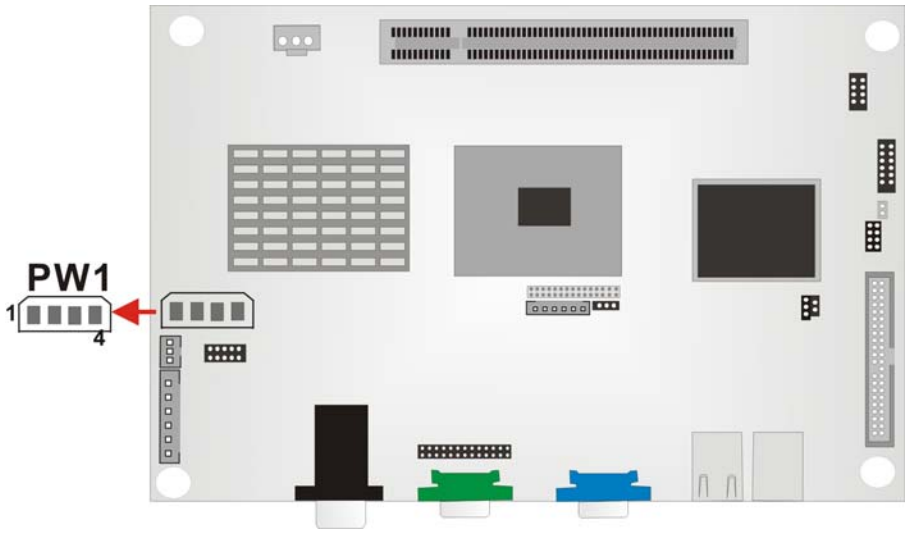


Figure 3-9: Power Connector Location

3.3.9 SO-DIMM Socket

CN Label: DIMM1

CN Type: 200-pin DDR-SDRAM SO-DIMM Socket

CN Location: See Figure 3-10

A 200-pin DDR-SDRAM SO-DIMM socket is located on the rear side of the Enano-8523T board. The SO-DIMM socket can support 266MHz DDR SO-DIMM SDRAM of up to 1GB

Figure 3-10: SO-DIMM Socket Location (Rear Side)

3.3.10 USB Connector

CN Label: USB1

CN Type: 8-pin header (2x4)

CN Location: See Figure 3-11

CN Pinouts: See Table 3-11

Two USB devices can be connected directly to the onboard USB connector. The onboard USB connector is USB 2.0 compliant.

PIN	DESCRIPTION	PIN	DESCRIPTION
1	USBVCC2	2	USBGND3
3	D2-	4	D3+
5	D2+	6	D3-
7	USBGND2	8	USBVCC3

Table 3-11: USB Connector Pinouts

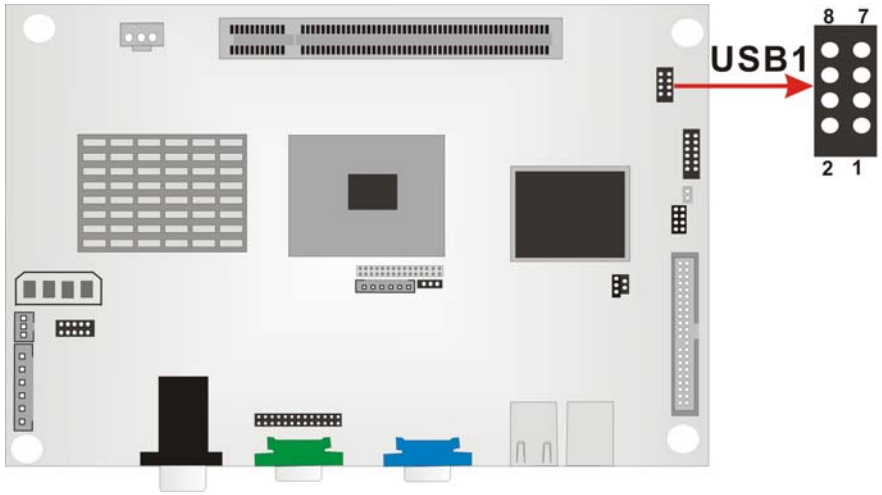


Figure 3-11: USB Connector Location

3.4 External Peripheral Interface Connectors

3.4.1 External Peripheral Interface Connector Overview

Figure 3-12 shows the Enano-8523T board rear panel. The peripheral connectors on the back panel can be connected to devices externally when the Enano-8523T is installed in a chassis. The peripheral connectors on the rear panel are:

- 3 x Serial ports
- 1 x VGA connector
- 1 x RJ-45 Ethernet connector
- 2 x USB connectors
- 3 x Audio jacks

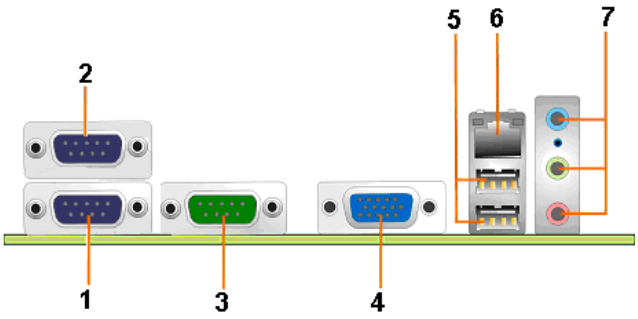


Figure 3-12: Enano-8523T Board Rear Panel

3.4.2 Serial Port Connectors

CN Label: CN6, J5

CN Type: DB-9

CN Location: See Figure 3-12 (labeled number 1, 2, 3)

CN Pinouts: See Table 3-12

The three serial ports (COM1, COM2 and COM3) can be connected to a serial communications device directly.

PIN	DESCRIPTION	PIN	DESCRIPTION
1	DCD1	2	DSR1
3	RX1	4	RTS1
5	TX1	6	CTS1
7	DTR1	8	RI1
9	GND		

Table 3-12: Serial Port Pinouts

3.4.3 USB Connectors

CN Label: J15

CN Type: USB port

CN Location: See Figure 3-12 (labeled number 5)

CN Pinouts: See Table 3-13

USB devices can be connected directly to the USB connectors on the rear panel.

PIN	DESCRIPTION	PIN	DESCRIPTION
1	+5V	2	DATA-
3	DATA+	4	GND

Table 3-13: USB Connectors

3.4.4 Ethernet Connector

CN Label: J15

CN Type: RJ-45

CN Location: See Figure 3-12 (labeled number 6)

CN Pinouts: See Table 3-14

The Ethernet connector can be directly connected to a Local Area Network (LAN) through a network hub. An RJ-45 Ethernet connector is shown in Error! Reference source not found..

PIN	DESCRIPTION	PIN	DESCRIPTION
1	TXD+	8	GND
2	TXD-	9	GRN+
3	RXD+	10	GRN-
4	CT_TXD	11	YEL-
5	CT_RXD	12	YEL+
6	RXD-	13	S GND
7	N/C	14	S GND

Table 3-14: RJ-45 Ethernet Connector Pinouts

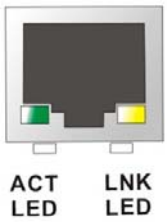


Figure 3-13: RJ-45 Ethernet Connector

The RJ-45 Ethernet connector has two status LEDs, one green and one yellow. The green LED indicates activity on the port and the yellow LED indicates the port is linked. See **Table 3-15**.

STATUS	DESCRIPTION	STATUS	DESCRIPTION
GREEN	Activity	YELLOW	Linked

Table 3-15: RJ-45 Ethernet Connector LEDs

3.4.5 VGA Connector

CN Label: VGA1

CN Type: 15-pin

CN Location: See Figure 3-12 (labeled number 4)

The standard 15-pin VGA connector connects to a CRT or LCD display monitor.

PIN	DESCRIPTION	PIN	DESCRIPTION
1	Red	9	No Connect
2	Green	10	Ground
3	Blue	11	No Connect
4	No Connect	12	DDC DAT
5	Ground	13	Horizontal Synchronization
6	Ground	14	Vertical Synchronization
7	Ground	15	DDC Clock
8	Ground		

Table 3-16: VGA Connector Pinouts

3.4.6 Audio Connector

CN Label: CN11

CN Type: 3 x audio jacks

CN Location: See Figure 3-12 (labeled number 7)

- **Line In port (Light Blue):** Connects a CD-ROM, DVD player, or other audio devices.
- **Line Out port (Lime):** Connects to a headphone or a speaker. With multi-channel configurations, this port can also connect to front speakers.
- **Microphone (Pink):** Connects a microphone.

3.5 Enano-8523T Motherboard On-board Jumpers

NOTE:

A jumper is a metal bridge used to close an electrical circuit. It consists of two or three metal pins and a small metal clip (often protected by a plastic cover) that slides over the pins to connect them. To CLOSE/SHORT a jumper means connecting the pins of the jumper with the plastic clip and to OPEN a jumper means removing the plastic clip from a jumper.

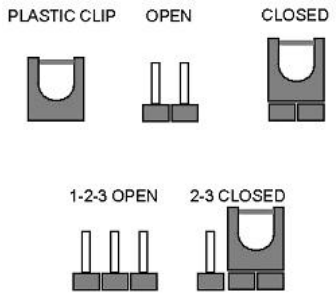


Figure 3-14: Jumpers

The Enano-8523T motherboard has several onboard jumpers (**Table 3-17**).

Description	Label	Type
Clear CMOS	JP2	3-pin header
CF card setup	JP4	2-pin header
LCD voltage select	JP6	3-pin header

Table 3-17: Jumpers

3.5.1 Clear CMOS Jumper

Jumper Label: **JP2**

Jumper Type: 3-pin header

Jumper Settings: See **Table 3-18**

Jumper Location: See **Figure 3-15**

If the Enano-8523T fails to boot due to improper BIOS settings, the CMOS can be cleared using the battery connector. Disconnect the battery from the connector for a few seconds then reconnect the battery. The CMOS should be cleared.

If the “CMOS Settings Wrong” message is displayed during the boot up process, the fault may be corrected by pressing the F1 to enter the CMOS Setup menu. Do one of the following:

- Enter the correct CMOS setting
- Load Optimal Defaults
- Load Failsafe Defaults.

After having done one of the above, save the changes and exit the CMOS Setup menu.

The clear CMOS jumper settings are shown in **Table 3-18**.

Clear CMOS	Description	
Short 1-2	Keep CMOS Setup	Default
Short 2-3	Clear CMOS Setup	

Table 3-18: JP2 Clear CMOS Jumper Settings

The location of the clear CMOS jumper is shown in **Figure 3-15** below.

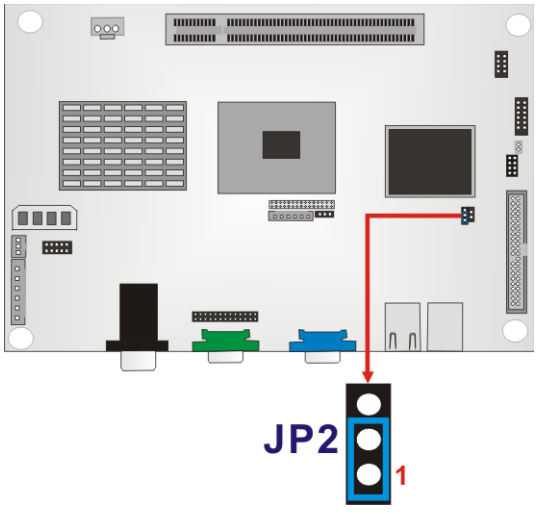


Figure 3-15: JP2 Clear CMOS Jumper

3.5.2 CF Card Setup Jumper

Jumper Label: **JP4**

Jumper Type: 2-pin header

Jumper Settings: See **Table 3-19**

Jumper Location: See **Figure 3-16**

Use the CF card setup jumper to set a CompactFlash® card as either the slave device or the master device. The CF card setup jumper selection options are shown in **Table 3-19**.

JP4	Description	
Open	Slave	Default
Short	Master	

Table 3-19: CF Card Setup Jumper Settings

The CF card setup jumper location is shown in **Figure 3-16** below.

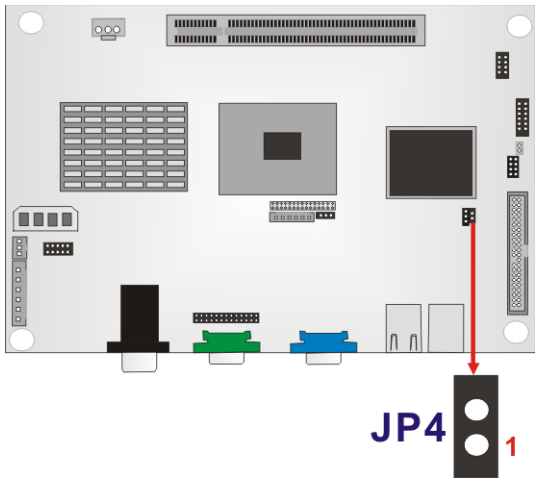


Figure 3-16: CF Card Setup Jumper Location

3.5.3 LCD Voltage Selection

WARNING:

Permanent damage to the screen and Enano-8523T may occur if the wrong voltage is selected with this jumper. Please refer to the user guide that came with the monitor to select the correct voltage.

Jumper Label:	**JP6**
Jumper Type:	3-pin header
Jumper Settings:	See **Table 3-20**
Jumper Location:	See **Figure 3-17**

The LCD Voltage Selection jumper allows the LCD screen voltage to be set. The LCD Voltage Selection jumper settings are shown in **Table 3-20**.

JP6	Description	
Short 1-2	+3.3V LVDS	Default
Short 2-3	+5V LVDS	

Table 3-20: LCD Voltage Selection Jumper Settings

The LCD Voltage Selection jumper location is shown in **Figure 3-17**.

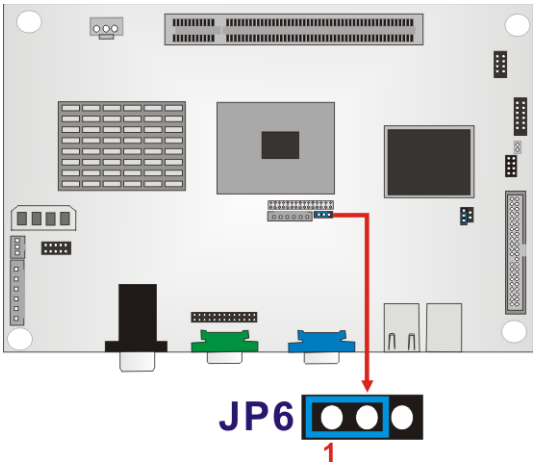


Figure 3-17: LCD Voltage Selection Jumper Location

3.6 Connector Mappings

This section describes how the connectors on the motherboard and power module are connected to different components within the system. When performing maintenance operations on the system it is imperative that the correct connections are made.

3.6.1 Power Connector

The connector mapping for the power module output power connector and the motherboard input power connector are shown in **Table 3-21**.

Enano-8523T	Power Module
PW1: Power	CN4: Output Power
Pin 1	Pin 1, Pin 2
Pin 2	Pin 3
Pin 3	Pin 4
Pin 4	Pin 5

Table 3-21: Motherboard Power Connector Mapping

3.6.2 ATX Mode Connector

The connector mapping for the ATX mode connector on the motherboard and power module are shown in **Table 3-22**.

Enano-8523T	Power Module
PW2: PS-ON	CN7: ATX Mode
Pin 1	Pin 1
Pin 2	Pin 2
Pin 3	Pin 3

Table 3-22: Motherboard ATX Power Connector Mapping

Chapter

4

Installation

4.1 Anti-static Precautions

WARNING:

If the following anti-static precautions are not followed, a user may be injured and the system irreparably damaged.

Electrostatic discharge (ESD) can cause serious damage to electronic components, including the Enano-8523T motherboard and the power module. (Dry climates are especially susceptible to ESD.) It is therefore critical that whenever the IBX-650B is opened and any electrical component handled, the following anti-static precautions are strictly adhered to.

- ***Wear an anti-static wristband***: - Wearing a simple anti-static wristband can help to prevent ESD from damaging the board.
- ***Self-grounding***:- Before handling the board, touch any grounded conducting material. During the time the board is handled, frequently touch any conducting materials that are connected to the ground.

4.2 Installation Procedure

4.2.1 Installation Procedure Overview

To properly install the IBX-650B, the following steps must be followed. Detailed descriptions of these instructions are listed in the sections that follow.

Step 1: Unpacking

Step 2: Configure the jumper settings

Step 3: Install the IDE hard disk drive (HDD)

Step 4: Mount the IBX-650B

Step 5: Connect the front panel peripheral connectors

Step 6: Power the system up

4.2.2 Unpacking

After the IBX-650B is received make sure the following components are included in the package. If any of these components are missing, please contact the IBX-650B reseller or vendor where it was purchased or contact an IEI sales representative immediately.

Quantity	Item	Image
1	IBX-650B embedded system	
1	Power cord	
1	Power adapter with ERP and PSE certificates (P/N: 63000-FSP025DGAA1702-RS)	
1	Screw set	
4	Foot pad	
1	Thermal pad for HDD	
1	Wall mount kit	
1	Driver and manual CD	

1	Quick installation guide	
1	DIN mount kit (optional)	

Table 4-1: Package List Contents

4.2.3 Top Cover Removal

Before the jumper settings can be configured and the hard disk drive can be installed, the top cover must be removed. To remove the top cover, please follow the steps below:

Step 1: Remove the top cover retention screws. The top cover is secured to the chassis with four retention screws, two in the right panel and the other two in the left panel (**Figure 4-1**). All four screws must be removed.

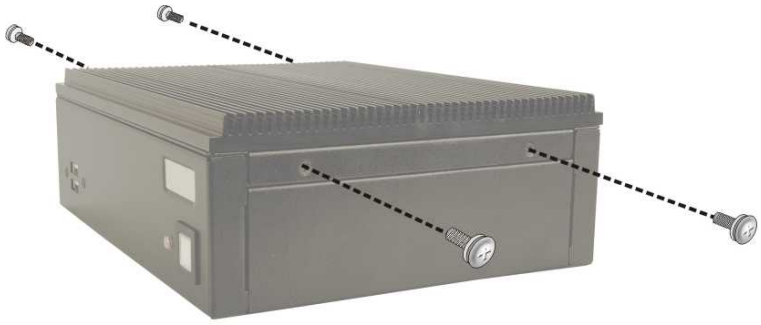


Figure 4-1: Top Cover Retention Screws

Step 2: Gently remove the top cover from the IBX-650B.

4.2.4 Configure the Jumper Settings

To configure the jumper settings, please follow the steps below.

Step 1: Remove the top cover. See **Section 4.2.3**.

Step 2: Locate the jumper settings on the embedded motherboard. See **Chapter 3**, **Section 3.5**.

Step 3: Make the jumper settings in accordance with the settings described and defined in **Section 3.5**.

4.2.5 IDE Hard Drive Installation

One 2.5” IDE hard drive supported. The IDE drive is installed into a hard drive bracket attached on the back of the top cover (**Figure 4-2**).

Figure 4-2: Hard Drive Bracket

To install the hard drive into the system, please follow the steps below.

Step 1: Remove the top cover. See Section 4.2.3.

Step 2: Remove the hard drive bracket from the back of the top cover by removing the four retention screws that secure the bracket to the top cover. (**Figure 4-3**)

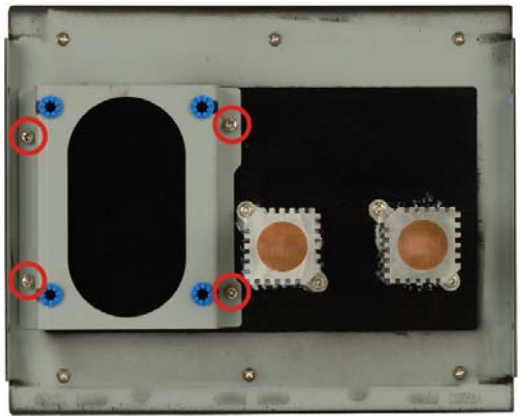


Figure 4-3:HDD Bracket Retention Screws

Step 3: Place the HDD into the bracket.

Step 4: Align the retention screw holes in the HDD with those in the bottom of the bracket.

Step 5: Secure the HDD with the bracket by inserting four retention screws into the bottom of the bracket (**Figure 4-4**).

Figure 4-4: HDD Retention Screws

Step 6: Locate the breather hole of the HDD. Cut off the corresponding area of the breather hole from the thermal pad.

Step 7: Adhere the thermal pad to the HDD. Make sure there is no obstacle covering the breather hole (**Figure 4-5**).

CAUTION:

Please locate the breather hole of the HDD and make sure the breather hole of the HDD is not covered. Covering the breather hole may cause damage to the HDD.

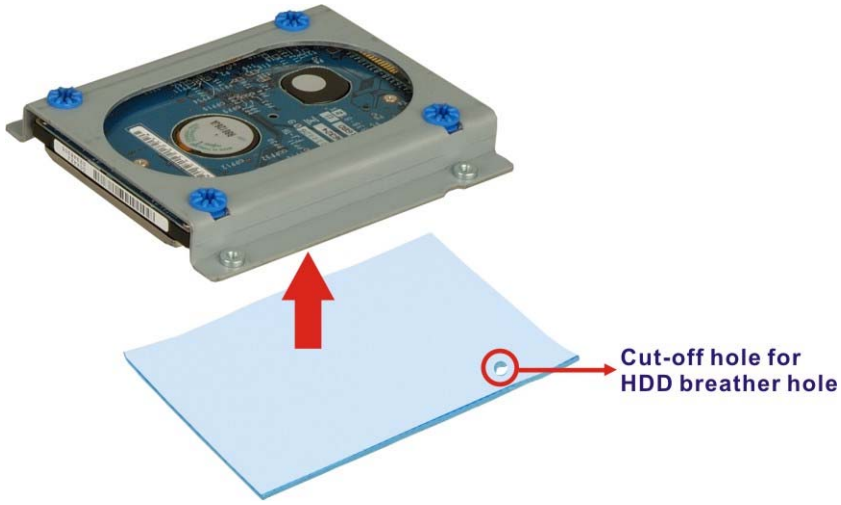


Figure 4-5: HDD Thermal Pad

Step 8: Replace the HDD bracket onto the top cover by aligning the four retention screw holes in the HDD bracket with those in the back of the top cover.

Step 9: Reinsert the four previously removed retention screws.

Step 10: Connect the IDE cable connector in the IBX-650B to the HDD.

Step 11: Replace the top cover to the chassis by reinserting the six previously removed retention screws.

4.2.6 CompactFlash® Card Installation

The IBX-650B embedded system has one CF slot on the rear panel. To install the CF card, follow the instructions below.

Step 1: Locate the CF card slot on the rear panel.

Step 2: Remove CF card slot cover by removing the two retention screws (**Figure 4-6**).

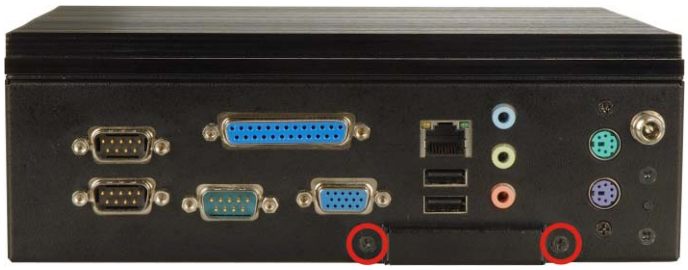


Figure 4-6: CF Card Slot Cover Retention Screws

Step 3: Insert the CF card into the slot. (**Figure 4-7**).

Figure 4-7: CF Card Installation

Step 4: Replace the CF card slot cover by inserting the two previously removed screws.

4.2.7 Foot Pad Installation

The IBX-650B embedded system is shipped with four foot pads. To install the foot pads, follow the instructions below.

Step 1: Turn the IBX-650B embedded system over.

Step 2: Locate the four retention screw holes for the food pad in the bottom surface. Please refer to **Figure 2-6**.

Step 3: Align the hole of the foot pad with the retention screw holes on the bottom surface.

Step 4: Secure the foot pad to the chassis by inserting the retention screw. (**Figure 4-8**).

Figure 4-8: Foot Pads Installation

4.2.8 Mounting the System with Wall Mount Kit

To mount the embedded system onto a wall using the VESA MIS-D 75 wall mount kit, please follow the steps below.

Step 1: Select the location on the wall for the wall-mounting bracket.

Step 2: Carefully mark the locations of the four bracket screw holes on the wall.

Step 3: Drill four pilot holes at the marked locations on the wall for the bracket retention screws.

Step 4: Align the wall-mounting bracket screw holes with the pilot holes.

Step 5: Secure the mounting-bracket to the wall by inserting the retention screws into the four pilot holes and tightening them (**Figure 4-9**).

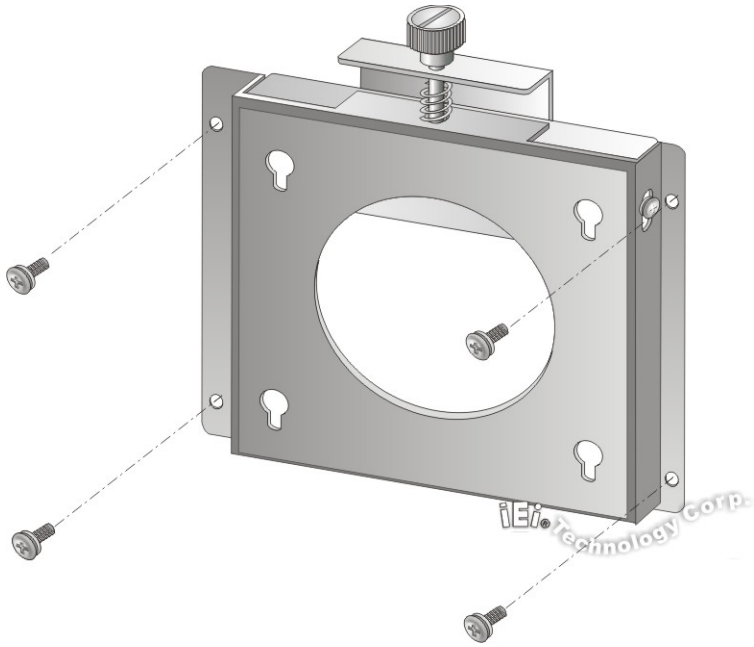


Figure 4-9: Wall-mounting Bracket

Step 6: Insert the four monitor mounting screws provided in the wall mounting kit into the four screw holes on the bottom panel of the system and tighten until the screw shank is secured against the bottom panel (**Figure 4-10**).

Step 5: Align the mounting screws on the IBX-650B bottom panel with the mounting holes on the bracket.

Step 6: Carefully insert the screws through the holes and gently pull the monitor downwards until the IBX-650B rests securely in the slotted holes (**Figure 4-10**). Ensure that all four of the mounting screws fit snuggly into their respective slotted holes.

NOTE:

In the diagram below the bracket is already installed on the wall.

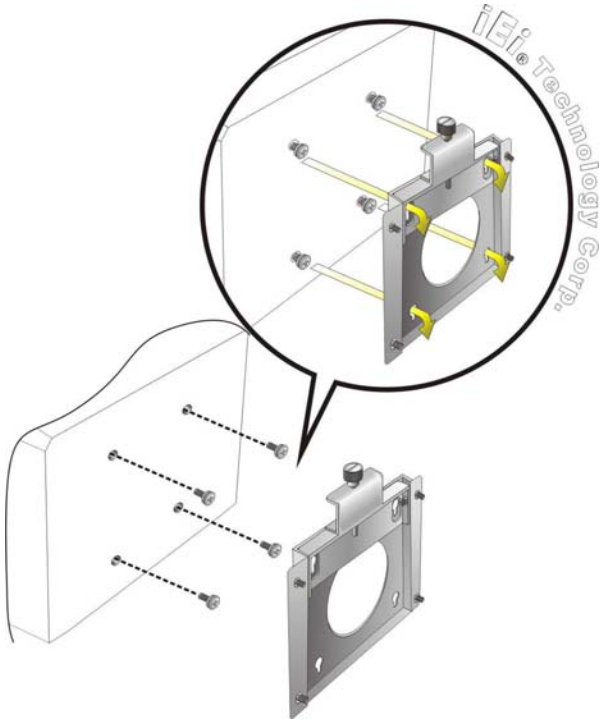


Figure 4-10: Mount the Embedded System

Step 7: Secure the embedded system by fastening the retention screw of the wall-mounting bracket. (**Figure 4-11**).

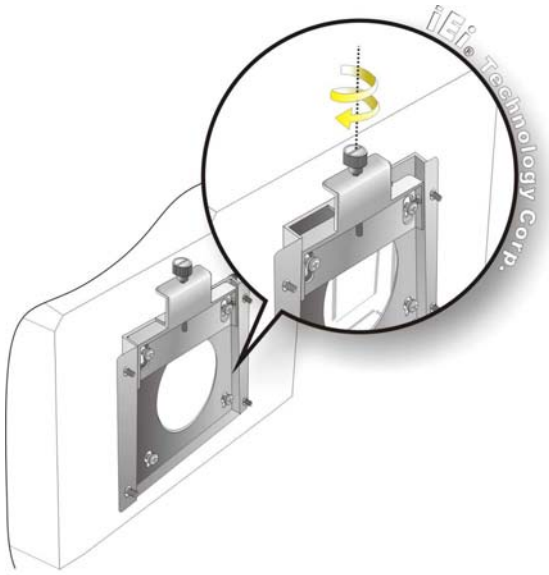


Figure 4-11: Secure the Embedded System

4.2.9 DIN Mounting

To mount the IBX-650B embedded system onto a DIN rail, please follow the steps below.

Step 1: Attach the DIN rail mounting bracket to the bottom panel of the embedded system. Secure the bracket to the embedded system with the supplied retention screws (**Figure 4-12**).

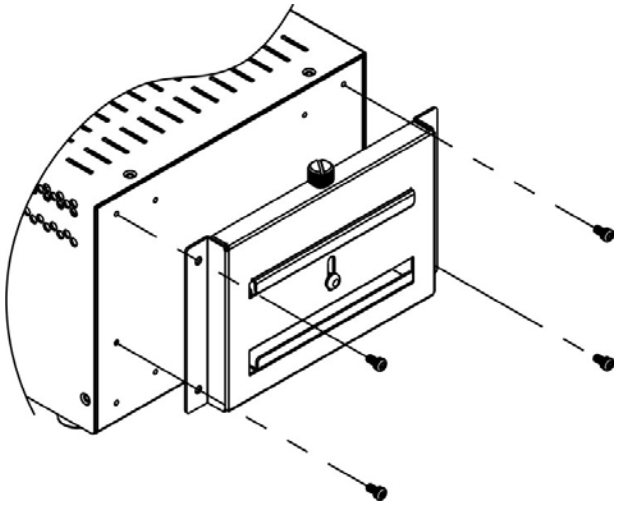


Figure 4-12: DIN Rail Mounting Bracket

Step 1: Make sure the inserted screw in the center of the bracket is at the lowest position of the elongated hole (**Figure 4-13**).

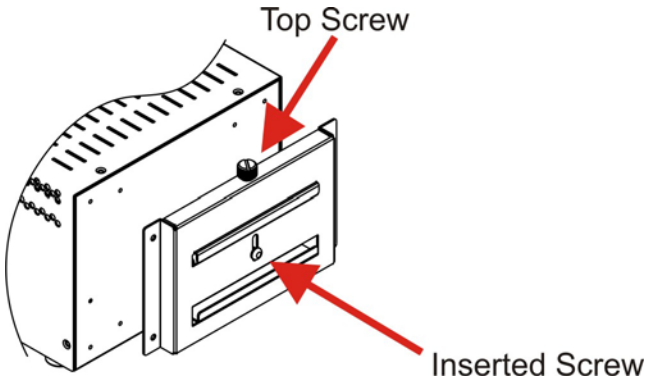


Figure 4-13: Screw Locations

Step 2: Place the DIN rail flush against the back of the mounting bracket making sure the edges of the rail are between the upper and lower clamps (**Figure 4-14**).

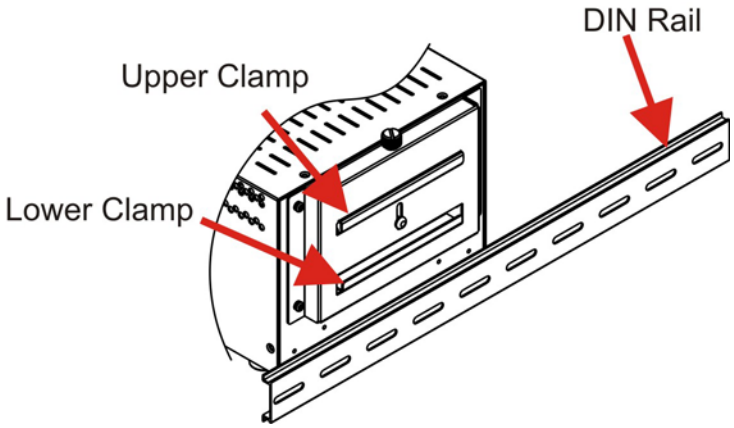


Figure 4-14: Mounting the DIN RAIL

Step 3: Secure the DIN rail to the mounting bracket by turning the top screw clockwise. This draws the lower clamp up and secures the embedded system to the DIN rail (**Figure 4-15**).

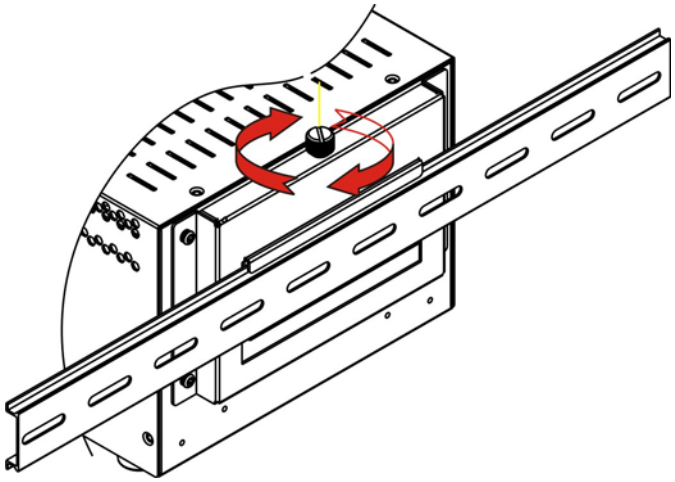


Figure 4-15: Secure the Assembly to the DIN Rail

4.2.10 Cable Connections

Once the system has been mounted on the wall, the following connectors can be connected to the system.

- VGA cable connector
- Keyboard/mouse connectors
- Audio jacks
- Parallel port connector
- Serial port connectors
- RJ-45 connectors
- USB devices can be connected to the system.

The cable connection locations are shown in **Figure 2-5**.

4.3 Power-On Procedure

4.3.1 Installation Checklist

WARNING:

Make sure a power supply with the correct input voltage is being fed into the system. Incorrect voltages applied to the system may cause damage to the internal electronic components and may also cause injury to the user.

To power on the embedded system please make sure of the following:

- The top cover is installed
- All peripheral devices (VGA monitor, serial communications devices etc.) are connected
- The power cables are plugged in
- The system is securely mounted

4.3.2 Power-on Procedure

To power-on the IBX-650B please follow the steps below:

Step 1: Push the power button.

Step 2: Once turned on, the power button should turns to blue. See **Figure 4-16**.

Figure 4-16: Power Button

Chapter

5

BIOS Settings

5.1 Introduction

A licensed copy of AMI BIOS is preprogrammed into the ROM BIOS. The BIOS setup program allows users to modify the basic system configuration. This chapter describes how to access the BIOS setup program and the configuration options that may be changed.

5.1.1 Starting Setup

The AMI BIOS is activated when the computer is turned on. The setup program can be activated in one of two ways.

1. Press the **DELETE** key as soon as the system is turned on or
2. Press the **DELETE** key when the "**Press Del to enter SETUP**" message appears on the screen.

If the message disappears before the **DELETE** key is pressed, restart the computer and try again.

5.1.2 Using Setup

Use the arrow keys to highlight items, press **ENTER** to select, use the PageUp and PageDown keys to change entries, press **F1** for help and press **ESC** to quit. Navigation keys are shown in.

Key	Function
Up arrow	Move to previous item
Down arrow	Move to next item
Left arrow	Move to the item on the left hand side
Right arrow	Move to the item on the right hand side
Esc key	Main Menu – Quit and not save changes into CMOS Status Page Setup Menu and Option Page Setup Menu -- Exit current page and return to Main Menu
"+" key	Increase the numeric value or make changes
"-" key	Decrease the numeric value or make changes

F1 key	General help, only for Status Page Setup Menu and Option Page Setup Menu
F2 /F3 key	Change color from total 16 colors. F2 to select color forward.
F10 key	Save all the CMOS changes, only for Main Menu

Table 5-1: BIOS Navigation Keys

5.1.3 Getting Help

When **F1** is pressed a small help window describing the appropriate keys to use and the possible selections for the highlighted item appears. To exit the Help Window press **Esc** or the **F1** key again.

5.1.4 Unable to Reboot After Configuration Changes

If the computer cannot boot after changes to the system configuration is made, CMOS defaults. Use the jumper described in **Chapter 3**, **Section 3.5.1.**

5.1.5 BIOS Menu Bar

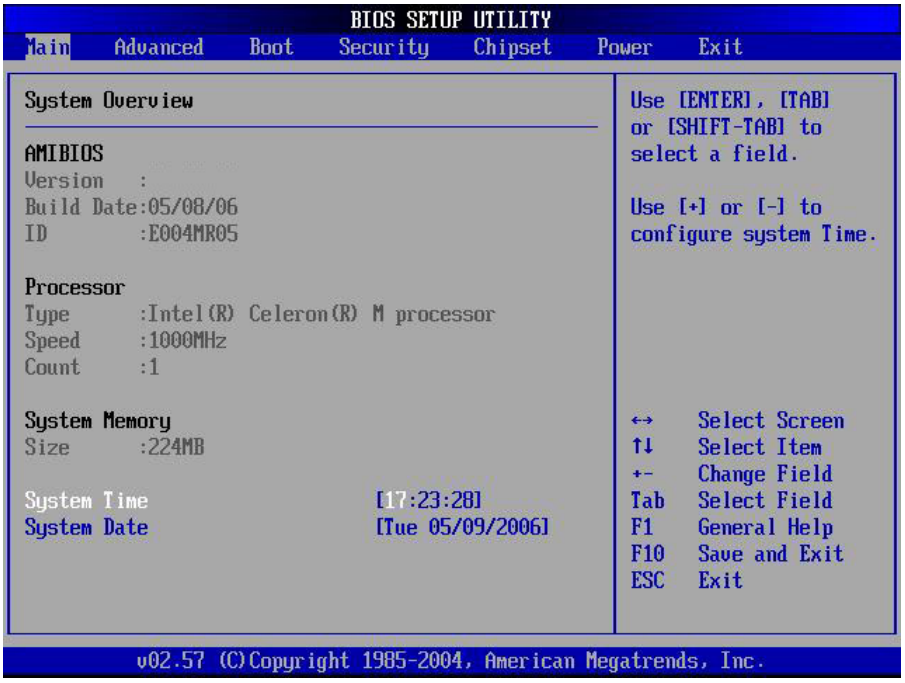
The **menu bar** on top of the BIOS screen has the following main items:

- **Main** Changes the basic system configuration.
- **Advanced** Changes the advanced system settings.
- **PCIPnP** Changes the advanced PCI/PnP Settings
- **Boot** Changes the system boot configuration.
- **Security** Sets User and Supervisor Passwords.
- **Chipset** Changes the chipset settings.
- **Power** Changes power management settings.
- **Exit** Selects exit options and loads default settings

The following sections completely describe the configuration options found in the menu items at the top of the BIOS screen and listed above.

5.2 Main

The **Main** BIOS menu (**BIOS Menu 1**) appears when the **BIOS Setup** program is entered. The **Main** menu gives an overview of the basic system information.



BIOS Menu 1: Main

➔ System Overview

The **System Overview** lists a brief summary of different system components. The fields in **System Overview** cannot be changed. The items shown in the system overview include:

- **AMI BIOS**: Displays auto-detected BIOS information
  - **Version**: Current BIOS version
  - **Build Date**: Date the current BIOS version was made
  - **ID**: Installed BIOS ID
- **Processor**: Displays auto-detected CPU specifications
  - **Type**: Names the currently installed processor
  - **Speed**: Lists the processor speed
  - **Count**: The number of CPUs on the motherboard
- **System Memory**: Displays the auto-detected system memory.

- **Size**: Lists memory size

The **System Overview** field also has two user configurable fields:

➔ **System Time [xx:xx:xx]**

Use the **System Time** option to set the system time. Manually enter the hours, minutes and seconds.

➔ **System Date [xx/xx/xx]**

Use the **System Date** option to set the system date. Manually enter the day, month and year.

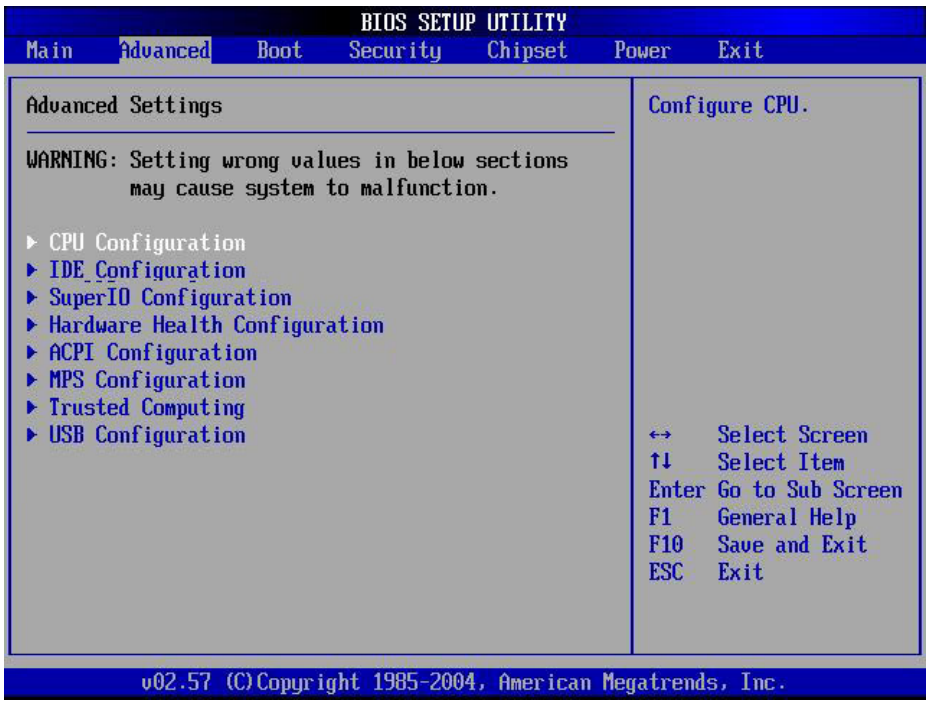
5.3 Advanced

Use the **Advanced** menu (**BIOS Menu 2**) to configure the CPU and peripheral devices through the following sub-menus:

WARNING!

Setting the wrong values in the sections below may cause the system to malfunction. Make sure that the settings made are compatible with the hardware.

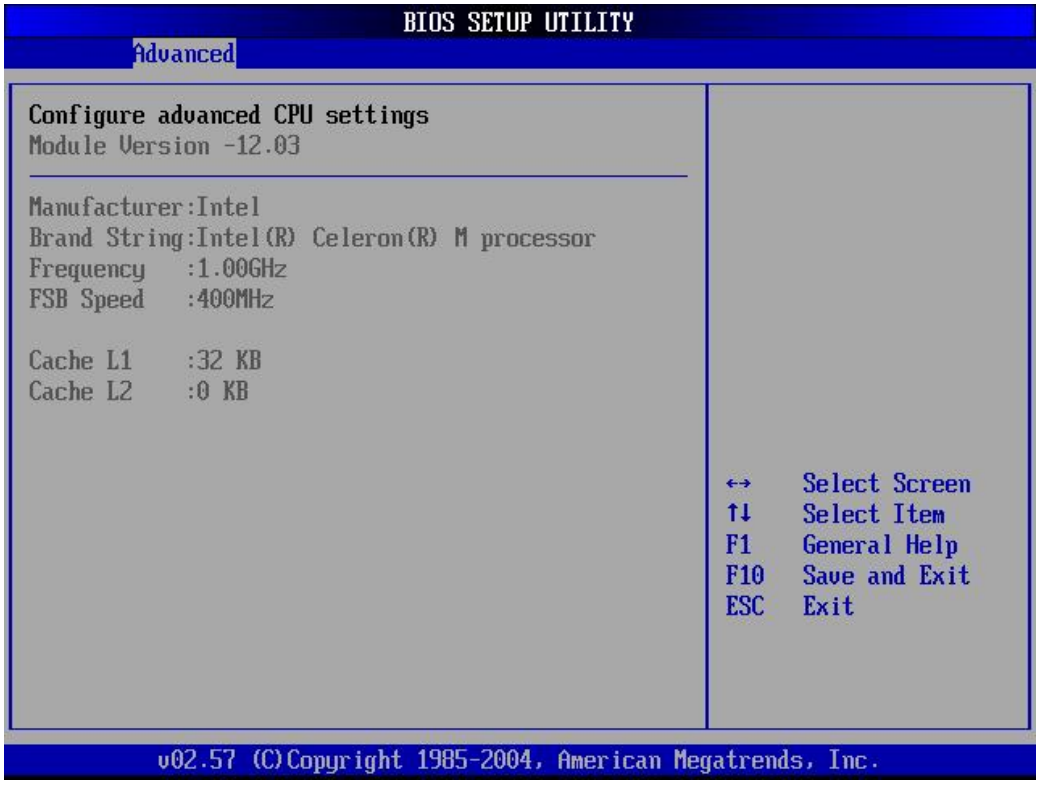
- CPU Configuration (see Section **5.3.1**)
- IDE Configuration (see Section **5.3.2**)
- Super IO Configuration (see Section **5.3.3**)
- Hardware Health Configuration (see Section **5.3.4**)
- ACPI Configuration (see Section **5.3.5**)
- MPS Configuration (see Section **5.3.6**)
- Trusted Computing (see Section **5.3.7**)
- USB Configuration (see Section **5.3.8**)



BIOS Menu 2: Advanced

5.3.1 CPU Configuration

Use the CPU Configuration menu (**BIOS Menu 3**) to view detailed CPU specifications and configure the CPU.



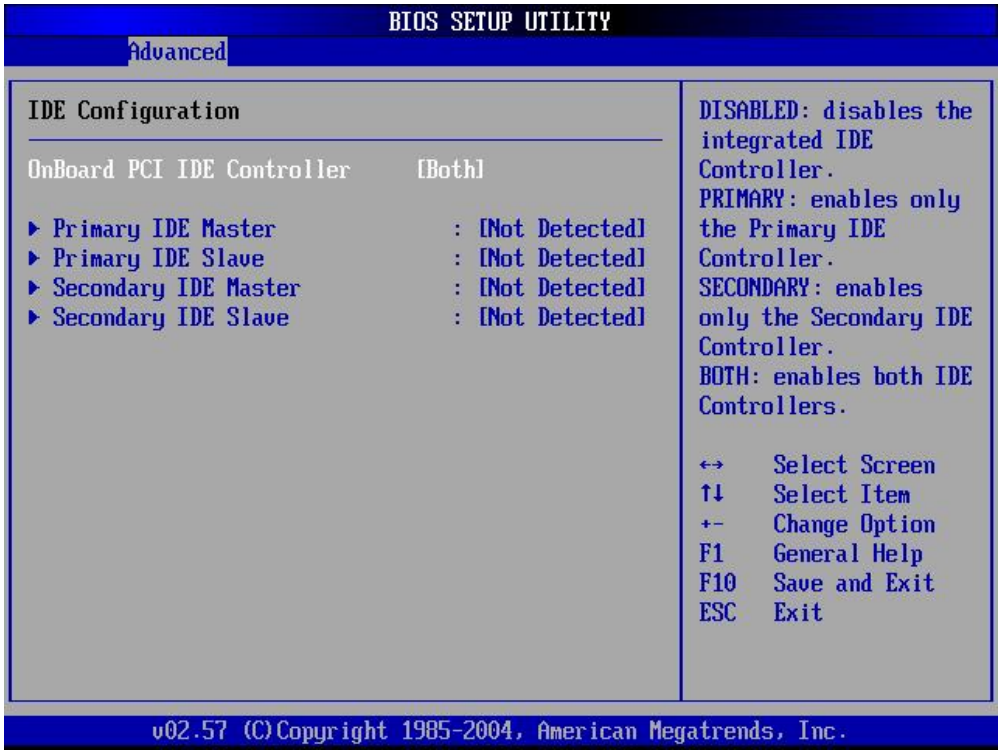
BIOS Menu 3: CPU Configuration

The CPU Configuration menu (**BIOS Menu 3**) lists the following CPU details:

- **Manufacturer**: Lists the name of the CPU manufacturer
- **Brand String**: Lists the brand name of the CPU being used
- **Frequency:** Lists the CPU processing speed
- **FSB Speed**: Lists the FSB speed
- **Cache L1**: Lists the CPU L1 cache size
- **Cache L2**: Lists the CPU L2 cache size

5.3.2 IDE Configuration

Use the **IDE Configuration** menu (**BIOS Menu 4**) to change and/or set the configuration of the IDE devices installed in the system.


BIOS SETUP UTILITY
Advanced
IDE Configuration
OnBoard PCI IDE Controller [Both]
Primary IDE Master : [Not Detected]
Primary IDE Slave : [Not Detected]
Secondary IDE Master : [Not Detected]
Secondary IDE Slave : [Not Detected]
DISABLED: disables the integrated IDE Controller.
PRIMARY: enables only the Primary IDE Controller.
SECONDARY: enables only the Secondary IDE Controller.
BOTH: enables both IDE Controllers.
↔ Select Screen
↑↓ Select Item
+- Change Option
F1 General Help
F10 Save and Exit
ESC Exit
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BIOS Menu 4: IDE Configuration

➔ **OnBoard PCI IDE Controller [Both]**

Use the **OnBoard PCI IDE Controller** BIOS option to specify the IDE channels used by the onboard PCI IDE controller. The following configuration options are available.

➔ **Disabled** Prevents the system from using the onboard IDE controller

➔ **Primary** Only allows the system to detect the Primary IDE channel, including both the Primary Master and the Primary Slave

➔ **Secondary** Only allows the system to detect the Secondary IDE channel, including both the Secondary Master and Secondary Slave

➔ **Both** **DEFAULT** Allows the system to detect both the Primary and Secondary IDE channels including the Primary Master, Primary Slave, Secondary Master and Secondary

Slave.

➔ **IDE Master and IDE Slave**

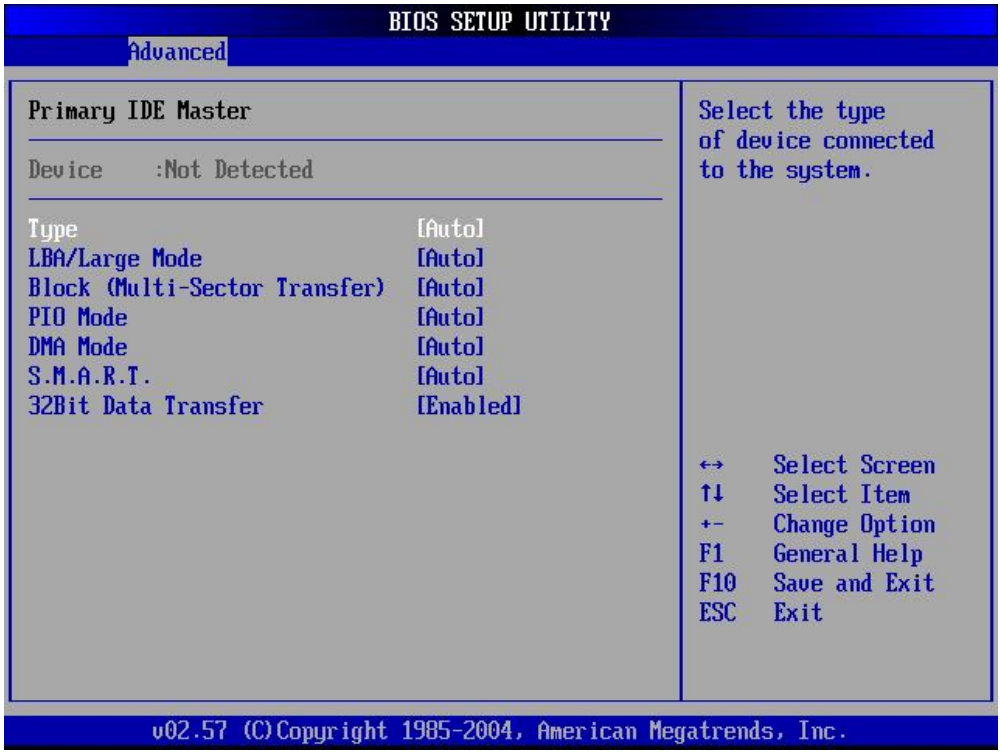
When entering setup, BIOS auto detects the presence of IDE devices. BIOS displays the status of the auto detected IDE devices. The following IDE devices are detected and are shown in the **IDE Configuration** menu:

- Primary IDE Master
- Primary IDE Slave
- Secondary IDE Master
- Secondary IDE Slave

The **IDE Configuration** menu (**BIOS Menu 4**) allows changes to the configurations for the IDE devices installed in the system. If an IDE device is detected, and one of the above listed four BIOS configuration options are selected, the IDE configuration options shown in **Section 5.3.2.1** appear.

5.3.2.1 IDE Master, IDE Slave

Use the **IDE Master** and **IDE Slave** configuration menu to view both primary and secondary IDE device details and configure the IDE devices connected to the system.



BIOS Menu 5: IDE Master and IDE Slave Configuration

➔ **Auto-Detected Drive Parameters**

The "grayed-out" items in the left frame are IDE disk drive parameters automatically detected from the firmware of the selected IDE disk drive. The drive parameters are listed as follows:

- **Device**: Lists the device type (e.g. hard disk, CD-ROM etc.)
- **Type**: Indicates the type of devices a user can manually select
- **Vendor**: Lists the device manufacturer
- **Size**: List the storage capacity of the device.
- **LBA Mode**: Indicates whether the LBA (Logical Block Addressing) is a method of addressing data on a disk drive is supported or not.
- **Block Mode**: Block mode boosts IDE drive performance by increasing the amount of data transferred. Only 512 bytes of data can be transferred per interrupt if block mode is not used. Block mode allows transfers of up to 64 KB per interrupt.
- **PIO Mode**: Indicates the PIO mode of the installed device.

- **Async DMA**: Indicates the highest Asynchronous DMA Mode that is supported.
- **Ultra DMA**: Indicates the highest Synchronous DMA Mode that is supported.
- **S.M.A.R.T.**: Indicates whether or not the Self-Monitoring Analysis and Reporting Technology protocol is supported.

➔ **Type [Auto]**

Use the **Type** BIOS option select the type of device the AMIBIOS attempts to boot from after the Power-On Self-Test (POST) is complete.

➔ **Not Installed** BIOS is prevented from searching for an IDE disk drive on the specified channel.

➔ **Auto** **DEFAULT** The BIOS auto detects the IDE disk drive type attached to the specified channel. This setting should be used if an IDE hard disk drive is attached to the specified channel.

➔ **CD/DVD** The CD/DVD option specifies that an IDE CD-ROM drive is attached to the specified IDE channel. The BIOS does not attempt to search for other types of IDE disk drives on the specified channel.

➔ **ARMD** This option specifies an ATAPI Removable Media Device. These include, but are not limited to:

- ➔ **ZIP**
- ➔ **LS-120**

➔ **LBA/Large Mode [Auto]**

Use the **LBA/Large Mode** option to disable or enable BIOS to auto detects LBA (Logical Block Addressing). LBA is a method of addressing data on a disk drive. In LBA mode, the maximum drive capacity is 137 GB.

➔ **Disabled** BIOS is prevented from using the LBA mode control on

the specified channel.

➔ **Auto** **DEFAULT** BIOS auto detects the LBA mode control on the specified channel.

➔ **Block (Multi Sector Transfer) [Auto]**

Use the **Block (Multi Sector Transfer)** to disable or enable BIOS to auto detect if the device supports multi-sector transfers.

➔ **Disabled** BIOS is prevented from using Multi-Sector Transfer on the specified channel. The data to and from the device occurs one sector at a time.

➔ **Auto** **DEFAULT** BIOS auto detects Multi-Sector Transfer support on the drive on the specified channel. If supported the data transfer to and from the device occurs multiple sectors at a time.

➔ **PIO Mode [Auto]**

Use the **PIO Mode** option to select the IDE PIO (Programmable I/O) mode program timing cycles between the IDE drive and the programmable IDE controller. As the PIO mode increases, the cycle time decreases.

➔ **Auto** **DEFAULT** BIOS auto detects the PIO mode. Use this value if the IDE disk drive support cannot be determined.

➔ **0** PIO mode 0 selected with a maximum transfer rate of 3.3MBps

➔ **1** PIO mode 1 selected with a maximum transfer rate of 5.2MBps

➔ **2** PIO mode 2 selected with a maximum transfer rate of 8.3MBps

➔ **3** PIO mode 3 selected with a maximum transfer rate of 11.1MBps

➔ **4** PIO mode 4 selected with a maximum transfer rate of 16.6MBps

(This setting generally works with all hard disk drives manufactured after 1999. For other disk drives, such as IDE CD-ROM drives, check the specifications of the drive.)

➔ **DMA Mode [Auto]**

Use the **DMA Mode** BIOS selection to adjust the DMA mode options.

➔ **Auto**	**DEFAULT**	BIOS auto detects the DMA mode. Use this value if the IDE disk drive support cannot be determined.
➔ **SWDMA0**		Single Word DMA mode 0 selected with a maximum data transfer rate of 2.1MBps
➔ **SWDMA1**		Single Word DMA mode 1 selected with a maximum data transfer rate of 4.2MBps
➔ **SWDMA2**		Single Word DMA mode 2 selected with a maximum data transfer rate of 8.3MBps
➔ **MWDMA0**		Multi Word DMA mode 0 selected with a maximum data transfer rate of 4.2MBps
➔ **MWDMA1**		Multi Word DMA mode 1 selected with a maximum data transfer rate of 13.3MBps
➔ **MWDMA2**		Multi Word DMA mode 2 selected with a maximum data transfer rate of 16.6MBps
➔ **UDMA1**		Ultra DMA mode 0 selected with a maximum data transfer rate of 16.6MBps
➔ **UDMA1**		Ultra DMA mode 1 selected with a maximum data transfer rate of 25MBps
➔ **UDMA2**		Ultra DMA mode 2 selected with a maximum data transfer rate of 33.3MBps
➔ **UDMA3**		Ultra DMA mode 3 selected with a maximum data transfer rate of 44MBps (To use this mode, it is required that an 80-conductor ATA cable is used.)
➔ **UDMA4**		Ultra DMA mode 4 selected with a maximum data transfer rate of 66.6MBps (To use this mode, it is required that an 80-conductor ATA cable is used.)
➔ **UDMA5**		Ultra DMA mode 5 selected with a maximum data transfer

rate of 99.9MBps (To use this mode, it is required that an 80-conductor ATA cable is used.)

➔ **S.M.A.R.T [Auto]**

Use the **S.M.A.R.T** option to auto-detect, disable or enable Self-Monitoring Analysis and Reporting Technology (SMART) on the drive on the specified channel. **S.M.A.R.T** predicts impending drive failures. The **S.M.A.R.T** BIOS option enables or disables this function.

➔ **Auto**	**DEFAULT**	BIOS auto detects HDD SMART support.
➔ **Disabled**		Prevents BIOS from using the HDD SMART feature.
➔ **Enabled**		Allows BIOS to use the HDD SMART feature

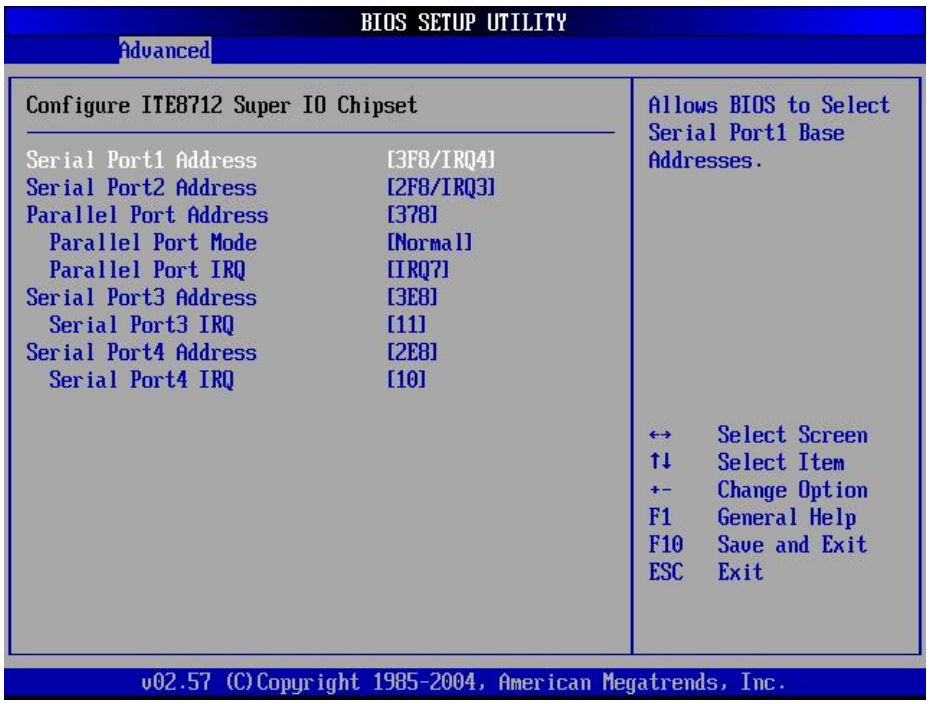
➔ **32Bit Data Transfer [Disabled]**

Use the **32Bit Data Transfer** BIOS option to enables or disable 32-bit data transfers.

➔ **Disabled**	**DEFAULT**	Prevents the BIOS from using 32-bit data transfers.
➔ **Enabled**		Allows BIOS to use 32-bit data transfers on supported hard disk drives.

5.3.3 Super IO Configuration

Use the **Super IO Configuration** menu (**BIOS Menu 6**) to set or change the configurations for the FDD controllers, parallel ports and serial ports.



BIOS Menu 6: Super IO Configuration

➔ **Serial Port1 Address [3F8/IRQ4]**

Use the **Serial Port1 Address** option to select the Serial Port 1 base address.

➔ **Disabled** No base address is assigned to Serial Port 1

➔ **3F8/IRQ4** **DEFAULT** Serial Port 1 I/O port address is 3F8 and the interrupt address is IRQ4

➔ **3E8/IRQ4** Serial Port 1 I/O port address is 3E8 and the interrupt address is IRQ4

➔ **2E8/IRQ3** Serial Port 1 I/O port address is 2E8 and the interrupt address is IRQ3

➔ **Serial Port2 Address [2F8/IRQ3]**

Use the **Serial Port2 Address** option to select the Serial Port 2 base address.

➔ **Disabled** No base address is assigned to Serial Port 2

- **2F8/IRQ3** **DEFAULT** Serial Port 2 I/O port address is 3F8 and the interrupt address is IRQ3
- **3E8/IRQ4** Serial Port 2 I/O port address is 3E8 and the interrupt address is IRQ4
- **2E8/IRQ3** Serial Port 2 I/O port address is 2E8 and the interrupt address is IRQ3

➔ **Parallel Port Address [378]**

Use the **Parallel Port Address** option to select the parallel port base address.

- **Disabled** No base address is assigned to the Parallel Port
- **378** **DEFAULT** Parallel Port I/O port address is 378
- **278** Parallel Port I/O port address is 278
- **3BC** Parallel Port I/O port address is 3BC

➔ **Parallel Port Mode [Normal]**

Use the **Parallel Port Mode** option to select the mode the parallel port operates in.

- **Normal** **DEFAULT** The normal parallel port mode is the standard mode for parallel port operation.
- **Bi-directional** Parallel port outputs are 8-bits long. Inputs are accomplished by reading 4 of the 8 bits on the status register.
- **EPP** The parallel port operates in the enhanced parallel port mode (EPP). The EPP mode supports bi-directional communication between the system and the parallel port device and the transmission rates between the two are much faster than the Normal mode.
- **ECP+EPP** The parallel port operates in the extended capabilities port (ECP) mode. The ECP mode

supports bi-directional communication between the system and the parallel port device and the transmission rates between the two are much faster than the Normal mode

The parallel port is also be compatible with EPP devices described above

➔ **Parallel Port IRQ [IRQ7]**

Use the **Parallel Port IRQ** selection to set the parallel port interrupt address.

- ➔ **IRQ5** IRQ5 is assigned as the parallel port interrupt address
- ➔ **IRQ7** **DEFAULT** IRQ7 is assigned as the parallel port interrupt address

➔ **Serial Port3 Address [3E8]**

Use the **Serial Port3 Address** option to select the base addresses for serial port 3

- ➔ **Disabled** No base address is assigned to serial port 3
- ➔ **3E8** **DEFAULT** Serial port 3 I/O port address is 3E8
- ➔ **2E8** Serial port 3 I/O port address is 2E8
- ➔ **2E0** Serial port 3 I/O port address is 2E0

➔ **Serial Port3 IRQ [11]**

Use the **Serial Port3 IRQ** option to select the interrupt address for serial port 3.

- ➔ **4** Serial port 3 IRQ address is 4
- ➔ **9** Serial port 3 IRQ address is 9
- ➔ **10** Serial port 3 IRQ address is 10
- ➔ **11** **DEFAULT** Serial port 3 IRQ address is 11

➔ **Serial Port4 Address [2E8]**

Use the **Serial Port4 IRQ** option to select the interrupt address for serial port 4.

- ➔ **Disabled** No base address is assigned to serial port 3
- ➔ **3E8** Serial port 4 I/O port address is 3E8
- ➔ **2E8** **DEFAULT** Serial port 4 I/O port address is 2E8
- ➔ **2E0** Serial port 4 I/O port address is 2E0

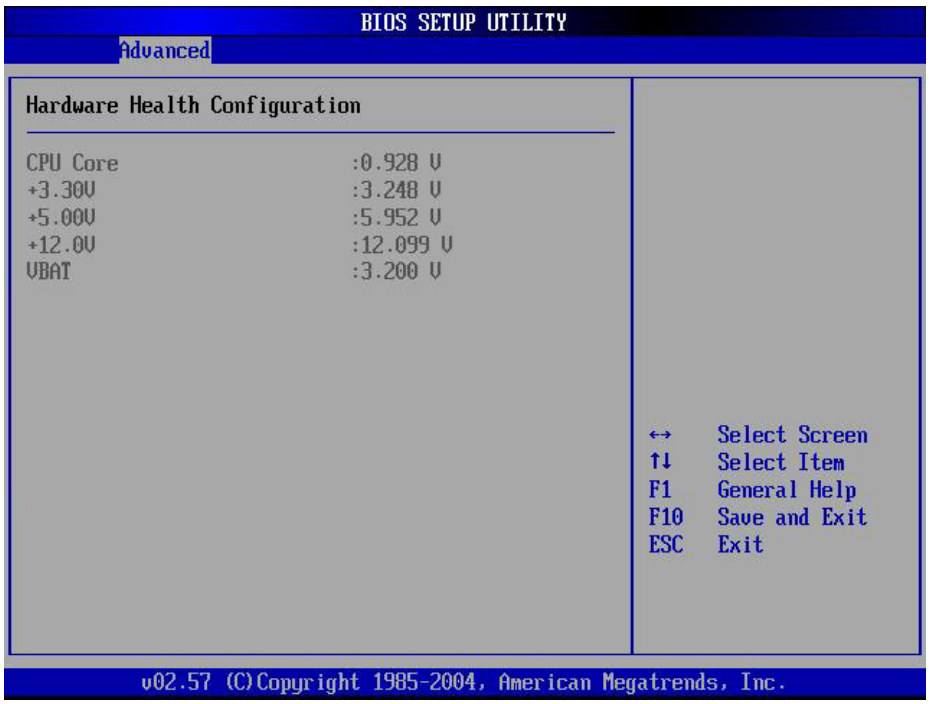
➔ **Serial Port4 IRQ [10]**

Use the **Serial Port4 IRQ** option to select the interrupt address for serial port 4.

- ➔ **3** Serial port 4 IRQ address is 3
- ➔ **9** Serial port 4 IRQ address is 9
- ➔ **10** **DEFAULT** Serial port 4 IRQ address is 10
- ➔ **11** Serial port 4 IRQ address is 11

5.3.4 Hardware Health Configuration

The **Hardware Health Configuration** menu (**BIOS Menu 7**) shows the operating temperature, fan speeds and system voltages.



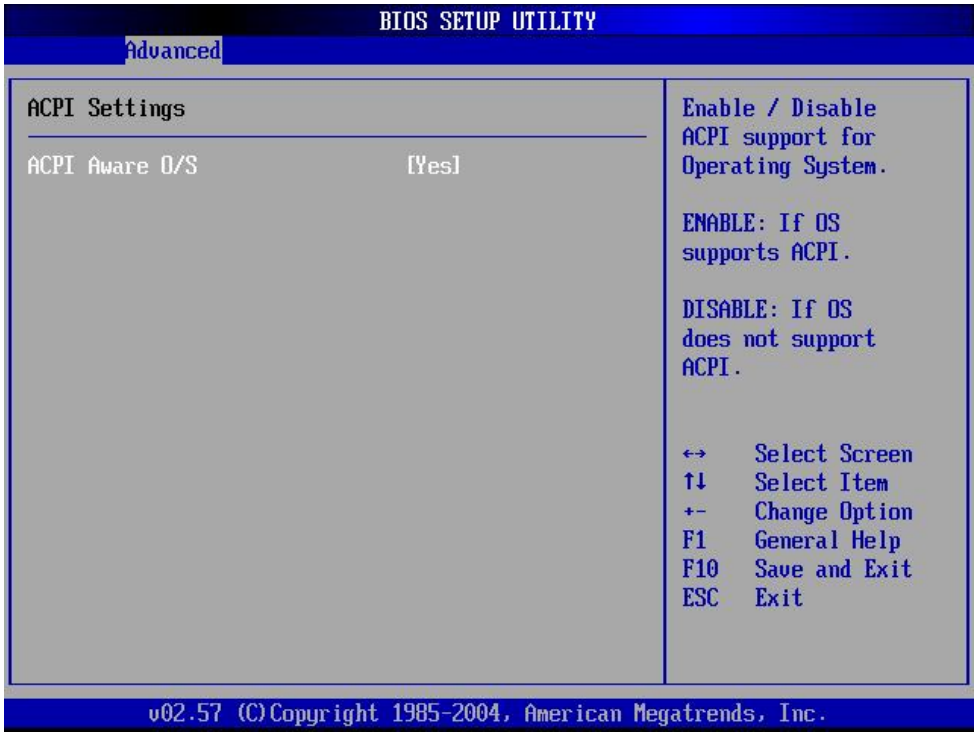
BIOS Menu 7: Hardware Health Configuration

The following system parameters and values are shown. The system parameters that are monitored are:

- **Fan Speeds**: The CPU cooling fan speed is monitored.
  - Fan1 Speed
- **Voltages**: The following system voltages are monitored
  - CPU Core
  - +3.30V
  - +5.00V
  - +12.0V
  - VBAT

5.3.5 ACPI Configuration

The **ACPI Configuration** menu (**BIOS Menu 8**) configures the Advanced Configuration and Power Interface (ACPI) and Power Management (APM) options.



BIOS Menu 8: ACPI Configuration

➔ **ACPI Aware O/S [Yes]**

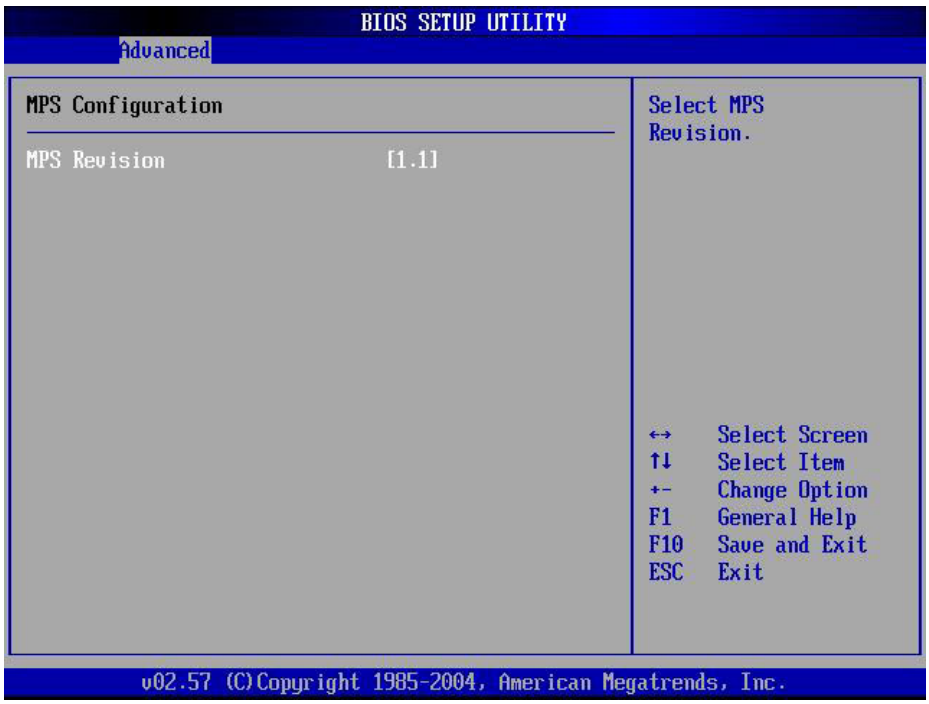
Use the **ACPI Aware O/S** option to enable the system to configure ACPI power saving options. ACPI can only be implemented if the system OS complies with the ACPI standard. Windows 98, Windows 2000, and Windows XP all comply with ACPI.

➔ **No** Disables the ACPI support for the OS. This selection should be disabled if the OS does not support ACPI

➔ **Yes** **DEFAULT** Enables the ACPI support for the operating system. This selection should be enabled if the OS does support ACPI

5.3.6 MPS Configuration

Use the MPS Configuration menu (**BIOS Menu 9**) to select `he multi-processor table.



BIOS Menu 9: MPS Configuration

➔ **MPS Revision [1.1]**

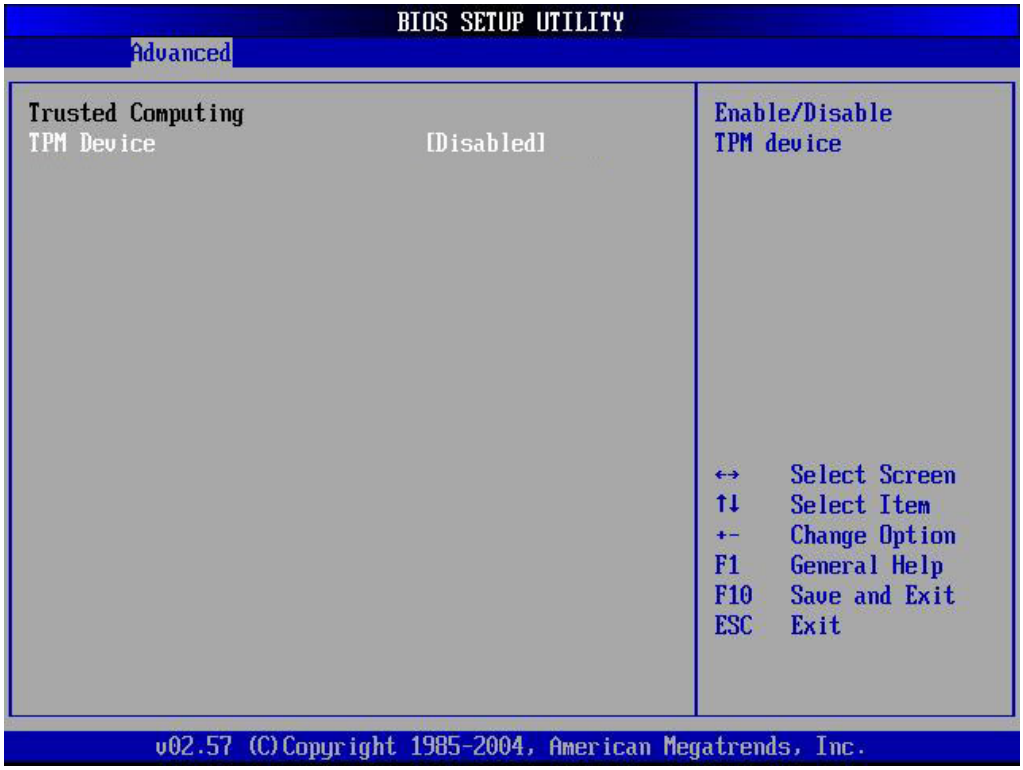
Use the **Multiprocessor Specification (MPS) for OS** option to specify the MPS version to be used.

➔ **1.1 DEFAULT** MPS version 1.1 is used

➔ **1.4** MPS version 1.4 is used

5.3.7 Trusted Computing

Use the **Trusted Computing** menu (**BIOS Menu 10**) to configure settings related to the Trusted Computing Group (TCG) Trusted Platform Module (TPM).



BIOS Menu 10: Trusted Computing

➔ **TPM Device [Disabled]**

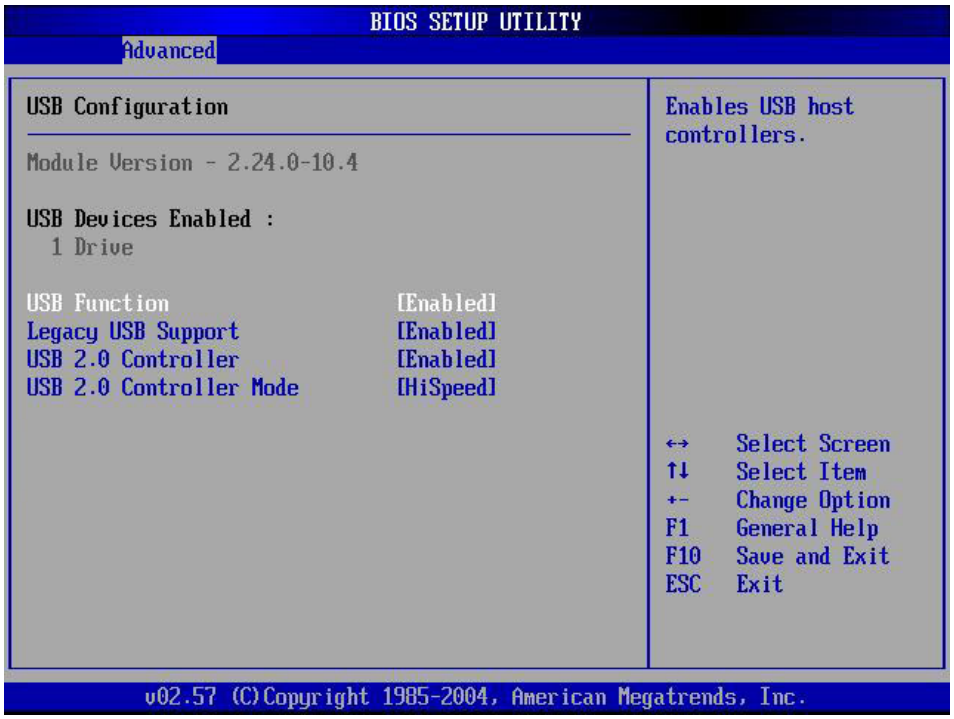
Use the **TPM Device** BIOS option to enable or disable the TPM security device.

➔ **Enabled** The BIOS loads the vendor specific TPM driver, records information that verifies the integrity of the BIOS and pre-boot process, and provides a runtime software interface to the TPM. Software at the operating system level uses data in the TPM for trusted applications.

➔ **Disabled** **DEFAULT** The TPM device is disabled and remains disabled until the computer is restarted and this BIOS option is enabled.

5.3.8 USB Configuration

Use the **USB Configuration** menu (**BIOS Menu 11**) to read USB configuration information and configure the USB settings.



BIOS Menu 11: USB Configuration

➔ **USB Configuration**

The **USB Configuration** field shows the system USB configuration. The items listed are:

- Module Version: x.xxxxx.xxxxx

➔ **USB Devices Enabled**

The **USB Devices Enabled** field lists the USB devices that are enabled on the system

➔ **USB Function [Enabled]**

Use the **USB Function** BIOS option to enable or disable USB function support.

➔ **Disabled** USB function support disabled

➔ **Enabled** **DEFAULT** USB function support enabled

➔ **Legacy USB Support [Enabled]**

Use the **Legacy USB Support** BIOS option to enable USB mouse and USB keyboard support.

Normally if this option is not enabled, any attached USB mouse or USB keyboard does not become available until a USB compatible operating system is fully booted with all USB drivers loaded. When this option is enabled, any attached USB mouse or USB keyboard can control the system even when there is no USB driver loaded onto the system.

➔ **Disabled** Legacy USB support disabled

➔ **Enabled** **DEFAULT** Legacy USB support enabled

➔ **Auto** Legacy USB support disabled if no USB devices are connected

➔ **USB 2.0 Controller [Enabled]**

Use the **USB 2.0 Controller** BIOS option to enable or disable the USB 2.0 controller

➔ **Disabled** USB 2.0 controller disabled

➔ **Enabled** **DEFAULT** USB 2.0 controller enabled

➔ **USB2.0 Controller Mode [HiSpeed]**

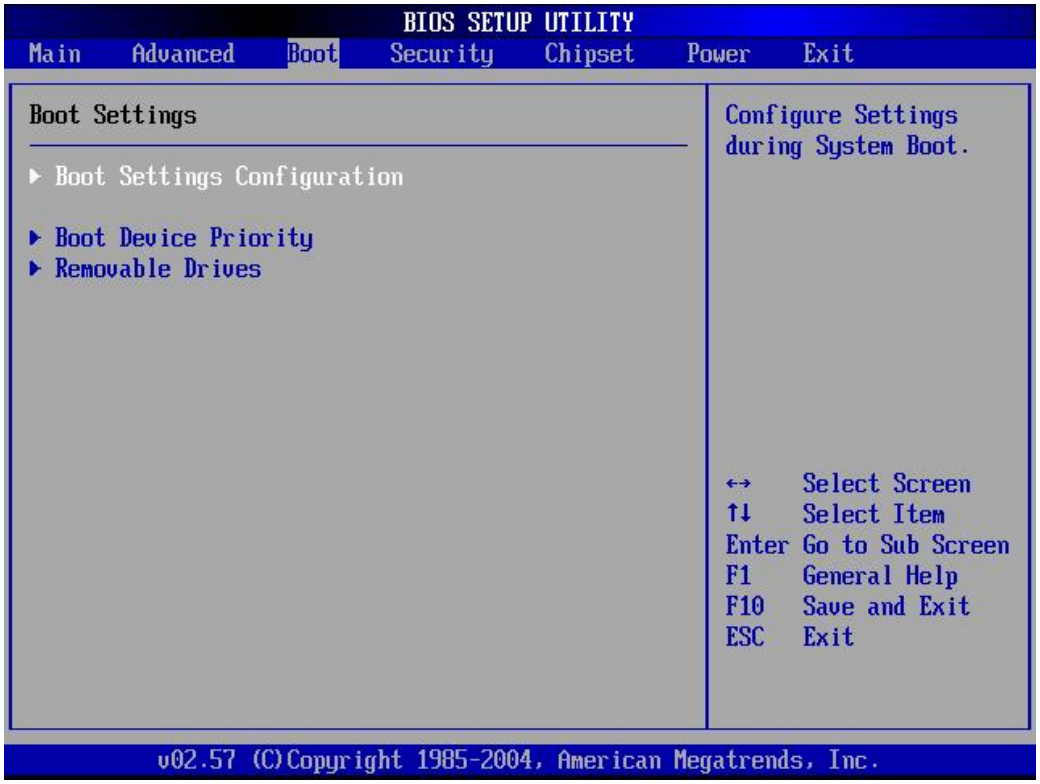
Use the **USB2.0 Controller Mode** option to set the speed of the USB2.0 controller.

➔ **FullSpeed** The controller is capable of operating at 12Mb/s

➔ **HiSpeed** **DEFAULT** The controller is capable of operating at 480Mb/s

5.4 Boot

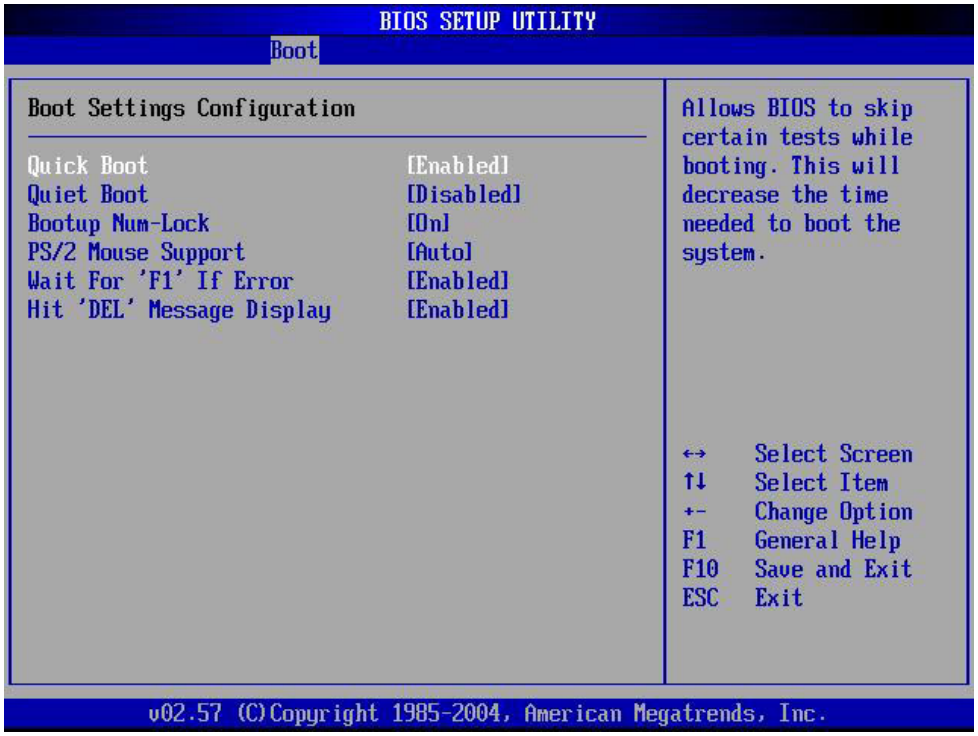
Use the Boot menu (**BIOS Menu 12**) to configure system boot options.



BIOS Menu 12: Boot

5.4.1 Boot Settings Configuration

Use the Boot Settings Configuration menu (**BIOS Menu 13**) to configure advanced system boot options.


BIOS SETUP UTILITY
Boot
Boot Settings Configuration
Quick Boot [Enabled]
Quiet Boot [Disabled]
Bootup Num-Lock [On]
PS/2 Mouse Support [Auto]
Wait For 'F1' If Error [Enabled]
Hit 'DEL' Message Display [Enabled]
Allows BIOS to skip certain tests while booting. This will decrease the time needed to boot the system.
↔ Select Screen
↑↓ Select Item
+- Change Option
F1 General Help
F10 Save and Exit
ESC Exit
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BIOS Menu 13: Boot Settings Configuration

➔ **Quick Boot [Enabled]**

Use the **Quick Boot** BIOS option to make the computer speed up the boot process.

➔ **Disabled**		No POST procedures are skipped
➔ **Enabled**	**DEFAULT**	Some POST procedures are skipped to decrease the system boot time

➔ **Quiet Boot [Disabled]**

Use the **Quiet Boot** BIOS option to select the screen display when the system boots.

➔ **Disabled**	**DEFAULT**	Normal POST messages displayed
➔ **Enabled**		OEM Logo displayed instead of POST messages

➔ **Bootup Num-Lock [On]**

Use the **Bootup Num-Lock** BIOS option to specify if the number lock setting must be modified during boot up.

➔ **Off**		Does not enable the keyboard Number Lock automatically. To use the 10-keys on the keyboard, press the Number Lock key located on the upper left-hand corner of the 10-key pad. The Number Lock LED on the keyboard lights up when the Number Lock is engaged.
➔ **On**	**DEFAULT**	Allows the Number Lock on the keyboard to be enabled automatically when the computer system boots up. This allows the immediate use of the 10-key numeric keypad located on the right side of the keyboard. To confirm this, the Number Lock LED light on the keyboard is lit.

➔ **PS/2 Mouse Support [Auto]**

Use the **PS/2 Mouse Support** option adjusts PS/2 mouse support capabilities.

➔ **Disabled**		PS/2 mouse support is disabled and prevented from using system resources.
➔ **Enabled**		Allows the system to use a PS/2 mouse.
➔ **Auto**	**DEFAULT**	The system auto-adjusts PS/2 mouse support.

➔ **Wait For 'F1' If Error [Enabled]**

Use the **Wait For 'F1' if Error** option to specify how the system responds when the system detects an error on boot up.

➔ **Disabled**	If there is an error when booting up, the system does not wait for user intervention but continues to boot up in the operating system. Only use this setting if there is a known reason for a BIOS error to appear. An example would be a system administrator must remote boot the system. The computer system does not have a keyboard

currently attached.

➔ **Enabled** **DEFAULT** If there is an error during boot up, the system waits for a user to press "F1" and enter the BIOS to rectify the problem. The BIOS can then be adjusted to the correct settings.

➔ **Hit 'DEL' Message Display [Enabled]**

Use the **Hit "DEL" Message Display** option to specify whether the instruction to hit the delete button to enter BIOS during POST appears or not.

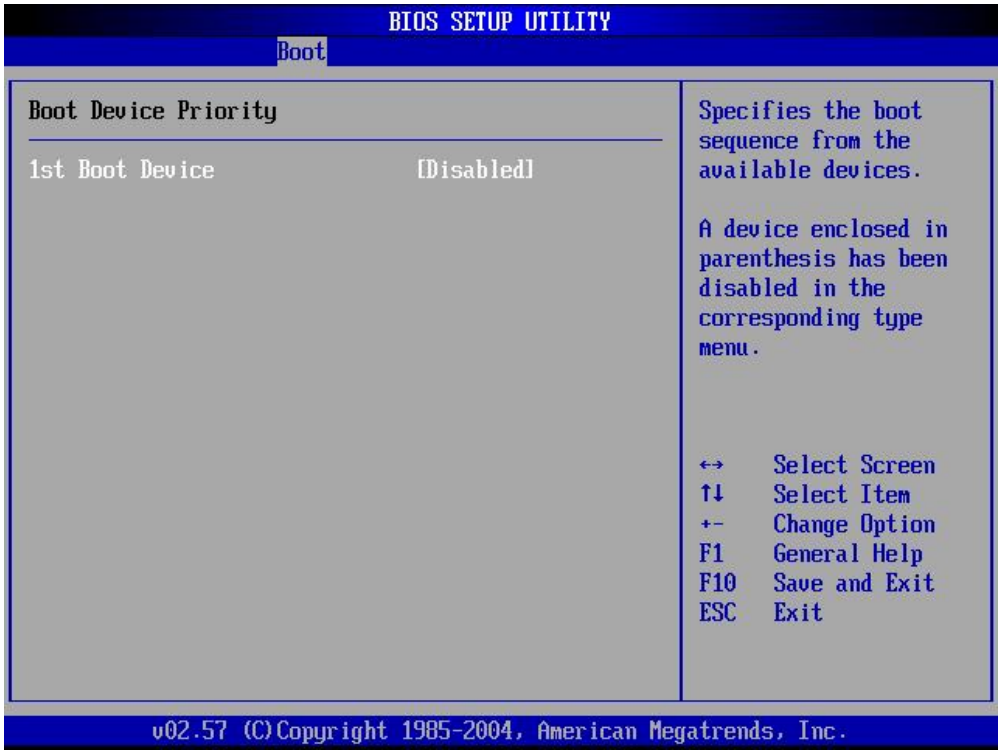
➔ **Disabled** No message displayed during POST

➔ **Enabled** **DEFAULT** Displays "**Press DEL to run Setup**" message in POST

5.4.2 Boot Device Priority

Use the **Boot Device Priority** menu (**BIOS Menu 14**) to specify the boot sequence from the available devices. Possible boot devices may include:

- HDD
- CD/DVD


BIOS SETUP UTILITY
Boot
Boot Device Priority
1st Boot Device [Disabled]
Specifies the boot sequence from the available devices.
A device enclosed in parenthesis has been disabled in the corresponding type menu.
↔ Select Screen
↑↓ Select Item
+- Change Option
F1 General Help
F10 Save and Exit
ESC Exit
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BIOS Menu 14: Boot Device Priority Settings

5.4.3 Hard Disk Drives

Use the **Hard Disk Drives** menu to specify the boot sequence of the available HDDs. When the menu is opened, the HDDs connected to the system are listed as shown below:

- 1st Drive [HDD: PM-(part number)]
- 2nd Drive [HDD: PS-(part number)]

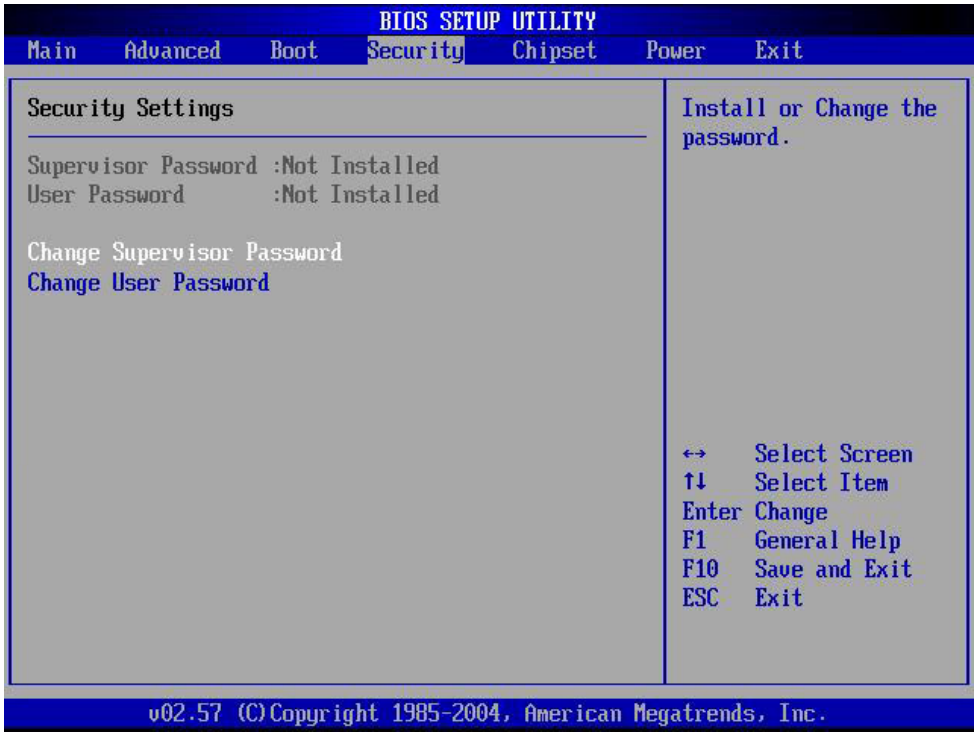
NOTE:

Only the drives connected to the system are shown. For example, if only two HDDs are connected only "**1st Drive**" and "**2nd Drive**" are listed.

The boot sequence from the available devices is selected. If the "**1st Drive**" option is selected a list of available HDDs is shown. Select the first HDD the system boots from. If the "**1st Drive**" is not used for booting this option may be disabled.

5.5 Security

Use the Security menu (**BIOS Menu 15**) to set system and user passwords.



BIOS Menu 15: Security

➔ **Change Supervisor Password**

Use the **Change Supervisor Password** to set or change a supervisor password. The default for this option is **Not Installed**. If a supervisor password must be installed, select this field and enter the password. After the password has been added, **Install** appears next to **Change Supervisor Password**.

➔ **Change User Password**

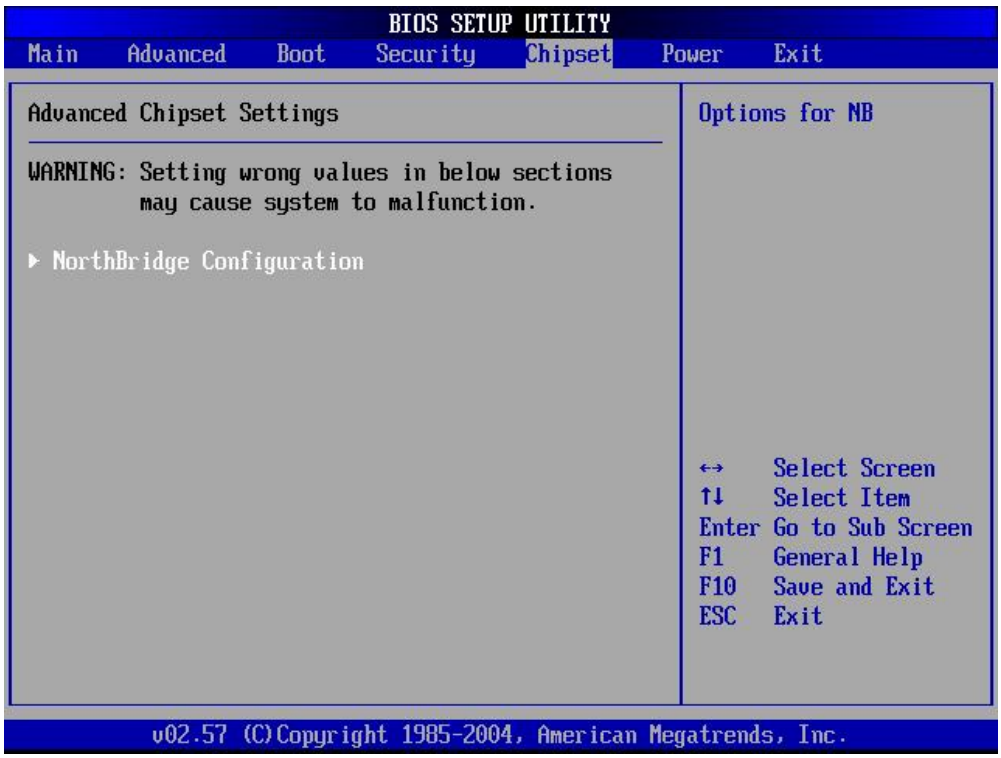
Use the **Change User Password** to set or change a user password. The default for this option is **Not Installed**. If a user password must be installed, select this field and enter the password. After the password has been added, **Install** appears next to **Change User Password**.

5.6 Chipset

Use the Chipset menu (**BIOS Menu 16**) to access the NorthBridge configuration menu.

WARNING!

Setting the wrong values for the Chipset BIOS selections in the Chipset BIOS menu may cause the system to malfunction.


BIOS SETUP UTILITY
Main Advanced Boot Security Chipset Power Exit
Advanced Chipset Settings
WARNING: Setting wrong values in below sections
may cause system to malfunction.
NorthBridge Configuration
Options for NB
↔ Select Screen
↑↓ Select Item
Enter Go to Sub Screen
F1 General Help
F10 Save and Exit
ESC Exit
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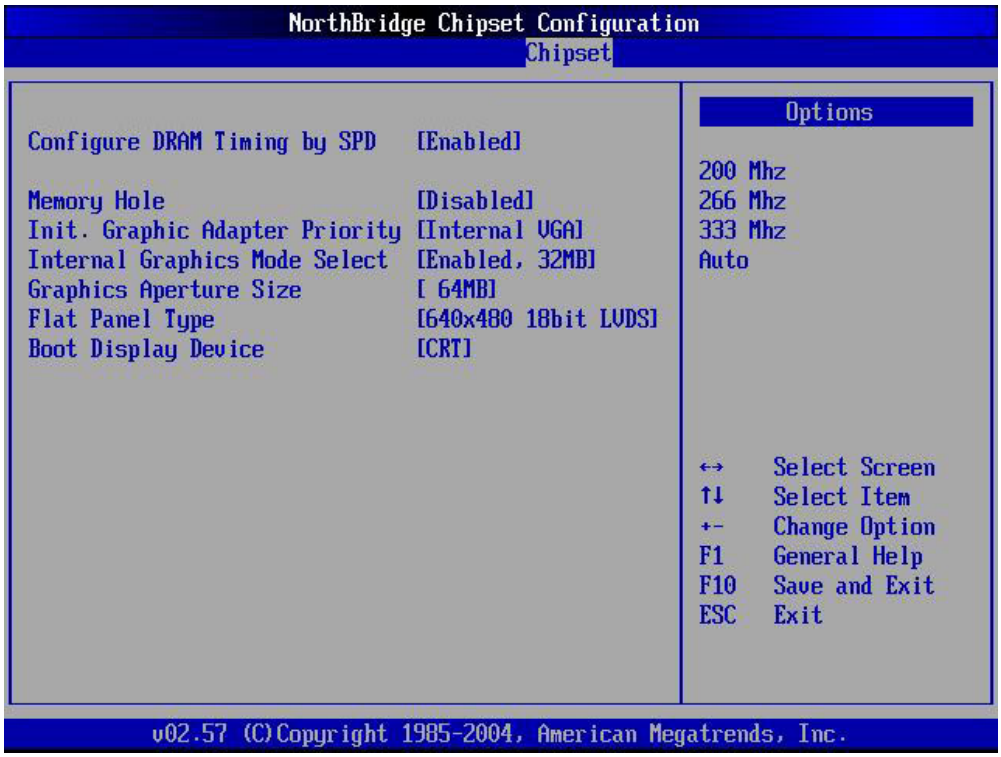
BIOS Menu 16: Chipset

5.6.1 NorthBridge Configuration

Use the NorthBridge Configuration menu (**BIOS Menu 17**) to configure the northbridge chipset.



BIOS Menu 17:NorthBridge Chipset Configuration

➔ **Configure DRAM Timing by SPD [Enabled]**

Use the **Configure DRAM Timing by SPD** option to determine if the system uses the SPD *(*Serial Presence Detect) EEPROM to configure the DRAM timing. The SPD EEPROM contains all necessary DIMM specifications including the speed of the individual components such as CAS and bank cycle time as well as valid settings for the module and the manufacturer's code. The SPD enables the BIOS to read the spec sheet of the DIMMs on boot-up and then adjust the memory timing parameters accordingly.

➔ **Disabled**		DRAM timing parameters are manually set using the DRAM sub-items
➔ **Enabled**	**DEFAULT**	DRAM timing parameter are set according to the DRAM Serial Presence Detect (SPD)

If the **Configure DRAM Timing by SPD** option is disabled, the following configuration options appear.

- DRAM CAS# Latency [2.5]
- DRAM RAS# Precharge [5 Clocks]
- DRAM RAS# to CAS# Delay [3 Clocks]
- DRAM Precharge Delay [7 Clocks]
- DRAM Burst Length [4]

➔ **DRAM CAS# Latency [2.5]**

Use the **CAS Latency Time** configuration option to set the Column Address Strobe (CAS) delay time. (To be able to change this configuration option the **DRAM Latency Timing** configuration option must be set to "**Manual**") The following configuration options are available

- 2.5 nanoseconds **DEFAULT**
- 2 nanoseconds

➔ **DRAM RAS# Precharge [3 Clocks]**

Use the **DRAM RAS# Precharge** option to set the speed at which the RAM terminates the access of one row and start accessing another. (To be able to change this configuration option the **DRAM RAS# Precharge** configuration option must be set to "**Manual**") The following configuration options are available

- 2 Clocks
- 3 Clocks **DEFAULT**

➔ **DRAM RAS# to CAS# Delay [3 Clocks]**

Use the **DRAM RAS# to CAS# Delay** option to specify the number of clock cycles must elapse between sending a RAS (row address strobe) signal and the CAS (column address strobe) signal. A pause is required between the RAS signal and the CAS signal to ensure the memory is correctly addressed. (To be able to change this configuration option the **Configure DRAM Timing by SPD** configuration option must be set to "**Disabled**") Configuration options are listed below:

- 2 Clocks
- 3 Clocks **DEFAULT**

➔ **DRAM Precharge Delay [7 clocks]**

Use the **Precharge Delay** option to set the time it takes for the RAS to start retrieving the actual data after a request has been issued to the memory module. (To be able to change this configuration option the **DRAM RAS# Precharge** configuration option must be set to "**Manual**") The following configuration options are available,

- 5 clocks
- 6 clocks
- 7 clocks **DEFAULT**

➔ **DRAM Burst Length [4]**

Use the **DRAM Burst Length** BIOS option to select the reads/writes per burst transaction. The following options are available,

- 4 → 4 read or writes per burst transaction
- 8 → 8 read or writes per burst transaction

➔ **Memory Hole [Disabled]**

Use the **Memory Hole** option to reserve memory space between 15MB and 16MB for ISA expansion cards that require a specified area of memory to work properly. If an older ISA expansion card is used, please refer to the documentation that came with the card to see if it is necessary to reserve the space.

➔ **Disabled**	**DEFAULT**	Memory is not reserved for ISA expansion cards
➔ **15MB – 16MB**		Between 15MB and 16MB of memory is reserved for ISA expansion cards

➔ **Init. Graphic Adapter Priority [Internal VGA]**

Use the **Init. Graphic Adapter Priority** option to select the graphics controller the system uses as a primary boot device. The options are:

- Internal VGA **DEFAULT**
- PCI/Int-VGA

➔ **Internal Graphics Mode Select [Enable, 32MB]**

Use the **Internal Graphic Mode Select** option to specify the amount of system memory that can be used by the Internal graphics device.

➔ **Disable**		
➔ **Enable, 1MB**		1MB of memory used by internal graphics device
➔ **Enable, 4MB**		4MB of memory used by internal graphics device
➔ **Enable, 8MB**		8MB of memory used by internal graphics device
➔ **Enable, 16MB**		16MB of memory used by internal graphics device
➔ **Enable, 32MB**	**DEFAULT**	32MB of memory used by internal graphics device

➔ **Graphics Aperture Size [64MB]**

Use the **Graphics Aperture Size** option to select the size of the AGP aperture. The aperture is a portion of the PCI memory address range dedicated as graphics memory address space.

➔ **64MB**	**DEFAULT**	Graphics aperture size set as 64MB
➔ **128MB**		Graphics aperture size set as 128MB
➔ **256MB**		Graphics aperture size set as 256MB

➔ **Flat Panel Type [640x480 18bit LVDS]**

Use the **Flat Panel Type** BIOS option to specify the flat panel PC type.

NOTE:

Please refer to the technical documents that came with the flat panel PC to ensure that the correct settings are selected.

The following options are available:

- 640x480 18bit LVDS **DEFAULT**
- 800x600 18bit LVDS
- 1024x768 18bit LVDS
- 1280x1024 36bit LVDS
- 1400x1050 36bit LVDS
- 1600x1200 36bit LVDS
- 1440x900 36bit LVDS
- 1440x900 48bit LVDS
- 1280x800 18bit LVDS
- 1024x768 24bit LVDS
- 1280x600 18bit LVDS

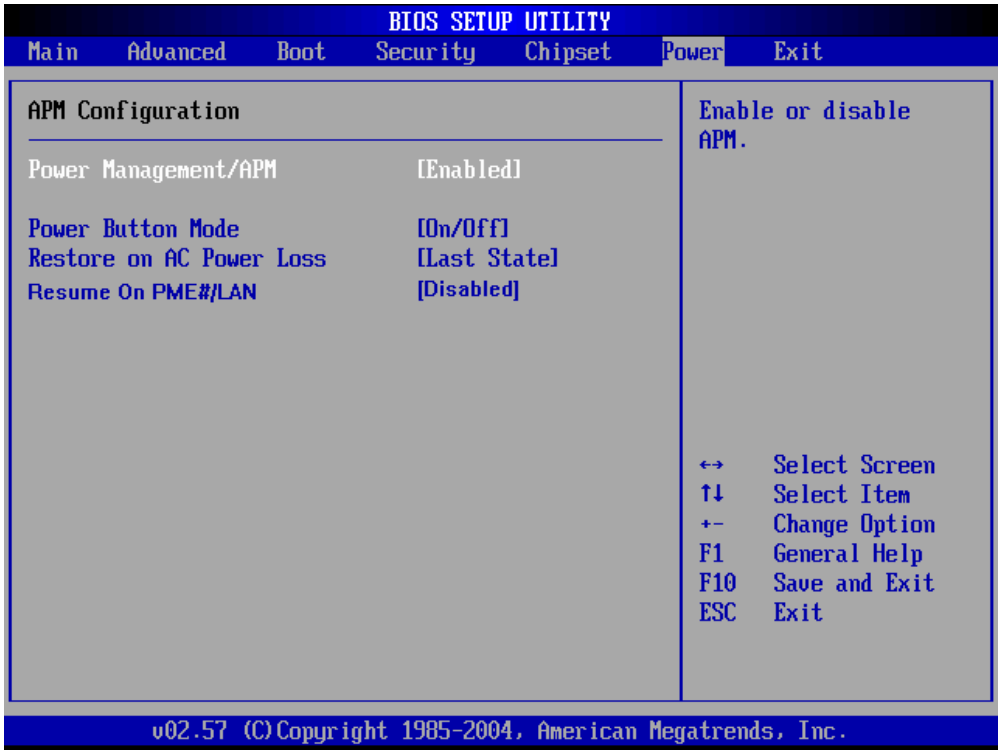
➔ **Boot Display Device [CRT]**

Use the **Boot Display Device** BIOS option to select the display device the system uses when it boots. The available options are listed below:

- CRT **DEFAULT**
- LFP
- CRT + LFP

5.7 Power

The **Power** menu (**BIOS Menu 18**) allows the advanced power management options to be configured.



BIOS Menu 18:Power

➔ **Power Management/APM [Enabled]**

Use the **Power Management/APM** BIOS option to enable access to the advanced power management features. If this option is disabled, the only other option on the screen is the **Power Button Mode**.

➔ **Disabled** Disables the Advanced Power Management (APM) feature

➔ **Enabled** **DEFAULT** Enables the APM feature

➔ **Power Button Mode [On/Off]**

Use the **Power Button Mode** BIOS to specify how the power button functions.

➔ **On/Off** **DEFAULT** When the power button is pressed the system is either turned on or off

➔ **Suspend** When the power button is pressed the system goes into suspend mode

➔ **Restore on AC Power Loss [Last State]**

The **Restore on AC Power Loss** BIOS option specifies what state the system returns to if there is a sudden loss of power to the system.

➔ **Power Off** The system remains turned off

➔ **Power On** The system turns on

➔ **Last State** **DEFAULT** The system returns to its previous state. If it was on, it turns itself on. If it was off, it remains off.

➔ **Resume On PME#/LAN [Disabled]**

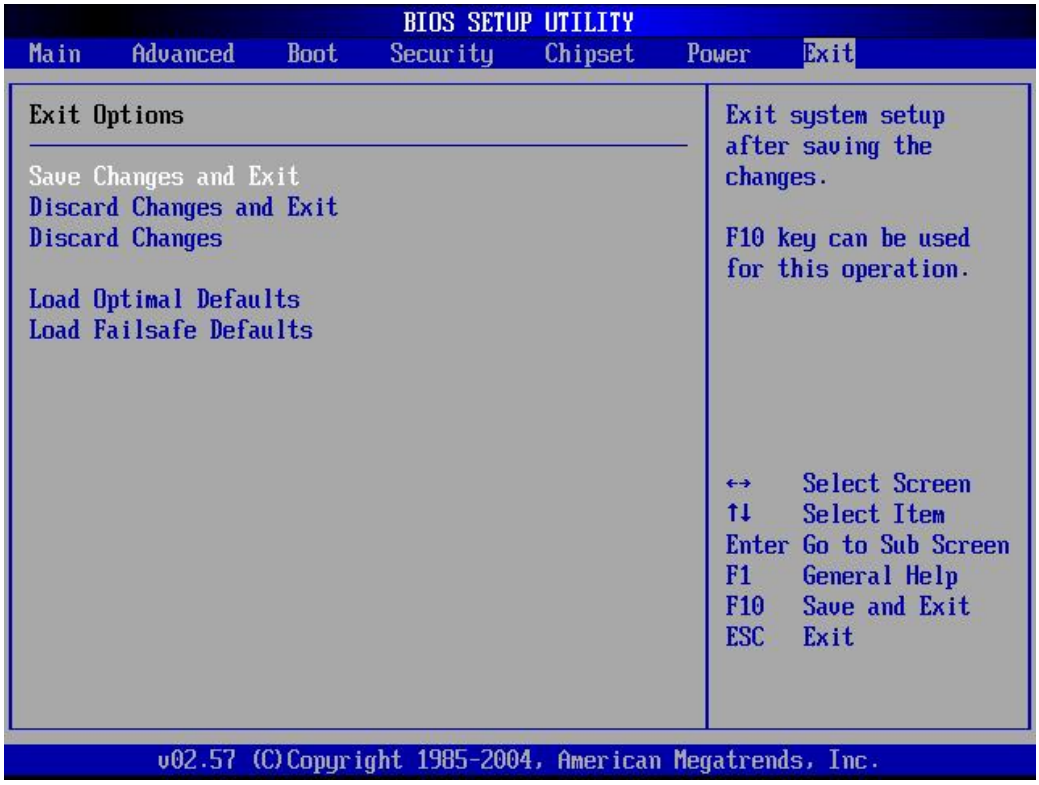
The **Resume on PME#/LAN** BIOS option specifies if the system will be roused from a suspended or standby state when there is activity on the PCI PME (power management event)/LAN controller.

➔ **Disabled** **DEFAULT** Wake event not generated by PCI PME/LAN controller activity

➔ **Enabled** Wake event generated by PCI PME/LAN controller activity

5.8 Exit

Use the **Exit** menu (**BIOS Menu 19**) to load default BIOS values, optimal failsafe values and to save configuration changes.


BIOS SETUP UTILITY
Main Advanced Boot Security Chipset Power Exit
Exit Options
Save Changes and Exit
Discard Changes and Exit
Discard Changes
Load Optimal Defaults
Load Failsafe Defaults
Exit system setup after saving the changes.
F10 key can be used for this operation.
↔ Select Screen
↑↓ Select Item
Enter Go to Sub Screen
F1 General Help
F10 Save and Exit
ESC Exit
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BIOS Menu 19:Exit

➔ **Save Changes and Exit**

Use the **Save Changes and Exit** option to save the changes made to the BIOS options and to exit the BIOS configuration setup program.

➔ **Discard Changes and Exit**

Use the **Discard Changes and Exit** option to exit the BIOS configuration setup program without saving the changes made to the system.

➔ **Discard Changes**

Use the **Discard Changes** option to discard the changes and remain in the BIOS configuration setup program.

➔ **Load Optimal Defaults**

Use the **Load Optimal Defaults** option to load the optimal default values for each of the parameters on the Setup menus. **F9 key can be used for this operation.**

➔ **Load Failsafe Defaults**

Use the **Load Failsafe Defaults** option to load failsafe default values for each of the parameters on the Setup menus. **F8 key can be used for this operation.**

Chapter

6

Driver Installation

6.1 Available Software Drivers

NOTE:

The contents of the CD may vary throughout the life cycle of the product and is subject to change without prior notice. You may visit the IEI website or contact technical support for the latest updates.

The Enano-8523T motherboard has four software drivers:

- Chipset
- Audio
- LAN
- VGA

All four drivers can be found on the CD that came with the IBX-650B. To install the drivers please follow the instructions in the sections below

6.2 Chipset Driver Installation

To install the chipsetdriver, please follow the steps below:

Step 1: Insert the CD into the CD drive connected with the embedded system. Open the **Chipset/852GM** directory and locate the icon for the **Setup** installation file. Once located, use the mouse to move the cursor over the icon and double click the mouse button.

Step 2: The "**InstallShield Wizard Preparation Screen**" in **Figure 6-1**appears.

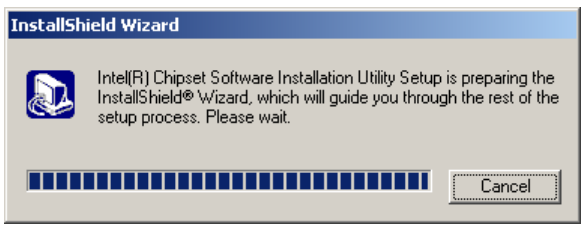

InstallShield Wizard
Intel(R) Chipset Software Installation Utility Setup is preparing the InstallShield® Wizard, which will guide you through the rest of the setup process. Please wait.
Cancel

Figure 6-1: InstallShield Wizard Preparation Screen

Step 3: The "**Welcome**" window in **Figure 6-2** appears next.

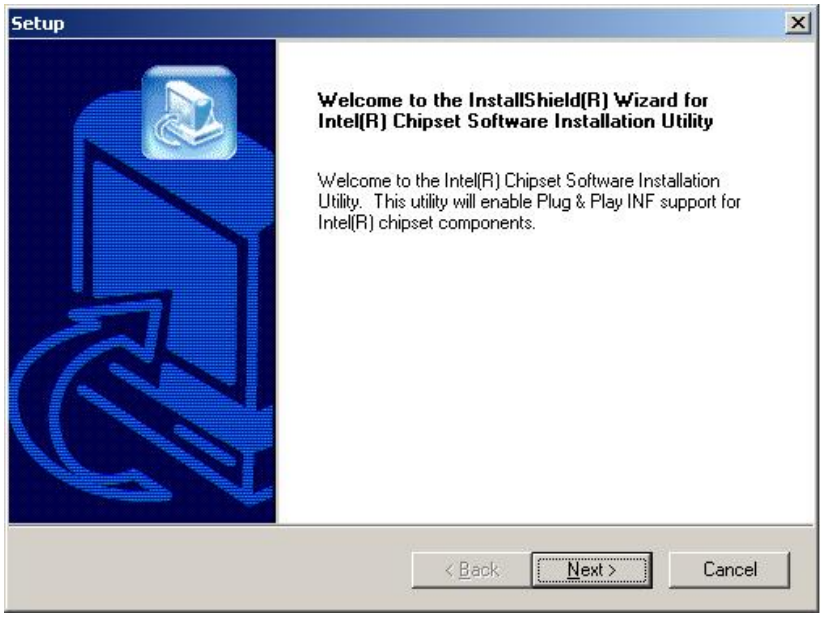

Setup
Welcome to the InstallShield(R) Wizard for Intel(R) Chipset Software Installation Utility
Welcome to the Intel(R) Chipset Software Installation Utility. This utility will enable Plug & Play INF support for Intel(R) chipset components.
< Back
Next >
Cancel

Figure 6-2: Welcome Screen

Step 4: Click "**NEXT**" and the license agreement shown in **Figure 6-3** appears.

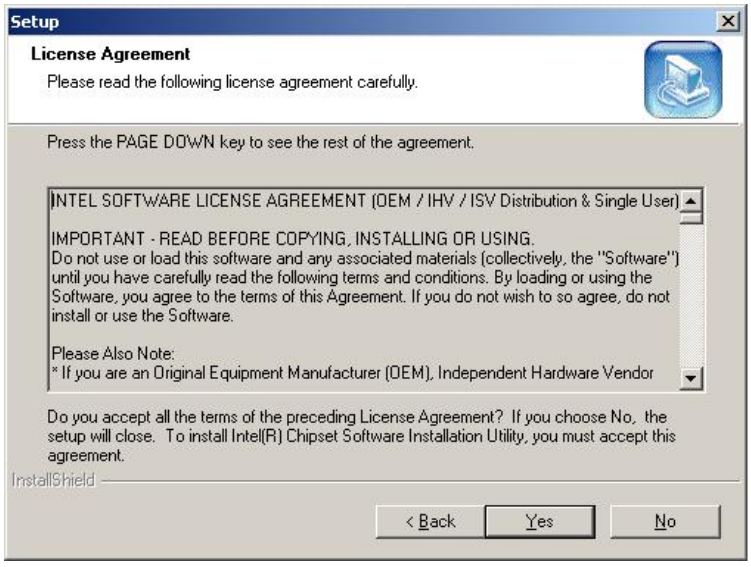

Setup
License Agreement
Please read the following license agreement carefully.
Press the PAGE DOWN key to see the rest of the agreement.
INTEL SOFTWARE LICENSE AGREEMENT (OEM / IHV / ISV Distribution & Single User)
IMPORTANT - READ BEFORE COPYING, INSTALLING OR USING.
Do not use or load this software and any associated materials (collectively, the "Software") until you have carefully read the following terms and conditions. By loading or using the Software, you agree to the terms of this Agreement. If you do not wish to so agree, do not install or use the Software.
Please Also Note:
* If you are an Original Equipment Manufacturer (OEM), Independent Hardware Vendor
Do you accept all the terms of the preceding License Agreement? If you choose No, the setup will close. To install Intel(R) Chipset Software Installation Utility, you must accept this agreement.
InstallShield
< Back
Yes
No

Figure 6-3: License Agreement

Step 5: Agree to the license terms by clicking "**YES**." The "**Readme**" in **Figure 6-4** appears.

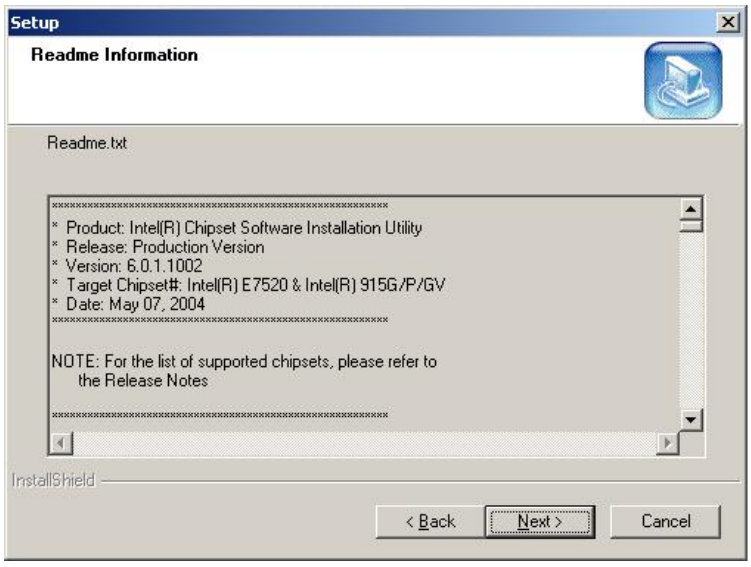


Figure 6-4: Readme Information

Step 6: Click "**YES**." The driver is installed on the computer. After the installation is complete the installation complete screen shown in **Figure 6-5** appears. Select the preferred option and click "**FINISH**" to complete the installation process.

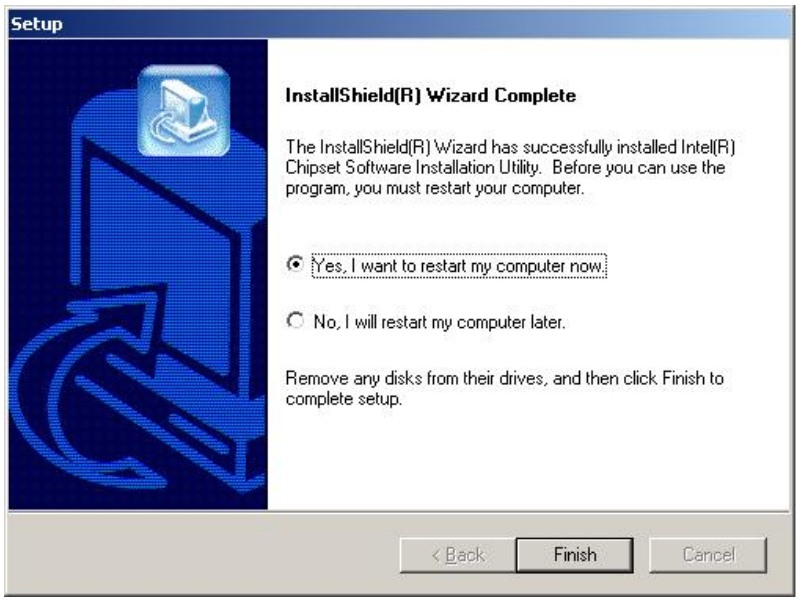

Setup
InstallShield(R) Wizard Complete
The InstallShield(R) Wizard has successfully installed Intel(R) Chipset Software Installation Utility. Before you can use the program, you must restart your computer.
Yes, I want to restart my computer now.
No, I will restart my computer later.
Remove any disks from their drives, and then click Finish to complete setup.
< Back
Finish
Cancel

Figure 6-5: Restart the Computer

6.3 RealTek Audio Driver Installation

To install the RealTek AC'97 Audio driver, please follow the steps below:

Step 1: Insert the CD into the CD drive connected with the embedded system. Open the CD folder and locate the **AUDIO DRIVER A3.79** directory. Open the directory and look for icon for the **setup.exe** installation file. Once located, use the mouse to move the cursor over the icon and double click the mouse button.

Step 2: Once double clicking the **Setup** icon, the install shield wizard for the audio driver starts. See **Figure 6-6.**

Figure 6-6: Audio Driver Install Shield Wizard Starting

Step 3: The RealTek Audio Setup prepares the install shield to guide the user through the rest of the setup process. See **Figure 6-7**.

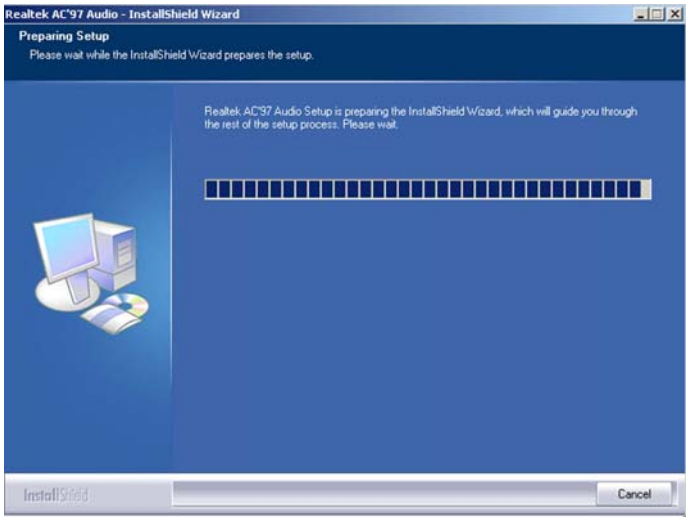

Realtek AC'97 Audio - InstallShield Wizard
Preparing Setup
Please wait while the InstallShield Wizard prepares the setup.
Realtek AC'97 Audio Setup is preparing the InstallShield Wizard, which will guide you through the rest of the setup process. Please wait.
InstallShield
Cancel

Figure 6-7: Audio Driver Setup Preparation

Step 4: After install shield is prepared, the welcome screen shown in **Figure 6-8** appears. To continue the installation process, click the "**NEXT**" button. The install shield starts to configure the new software as shown in **Figure 6-9**.

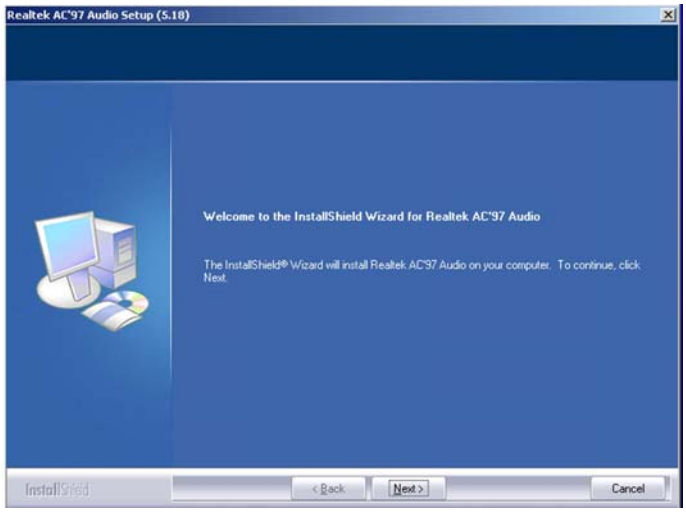

Realtek AC'97 Audio Setup (5.18)
Welcome to the InstallShield Wizard for Realtek AC'97 Audio
The InstallShield® Wizard will install Realtek AC'97 Audio on your computer. To continue, click Next.
InstallShield
< Back
Next >
Cancel

Figure 6-8: Audio Driver Welcome Screen

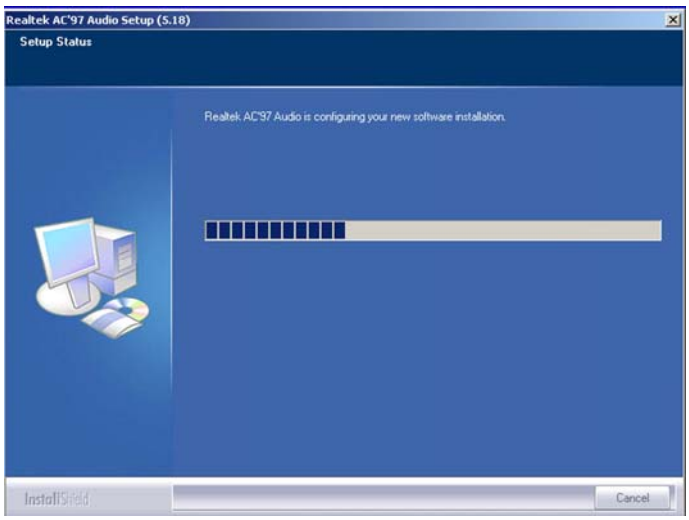


Figure 6-9: Audio Driver Software Configuration

Step 5: At this stage the "**Digital Signal Not Found**" screen shown in **Figure 6-10** appears. To continue the installation process, click the "**YES**" button. The installation notice shown below appears.

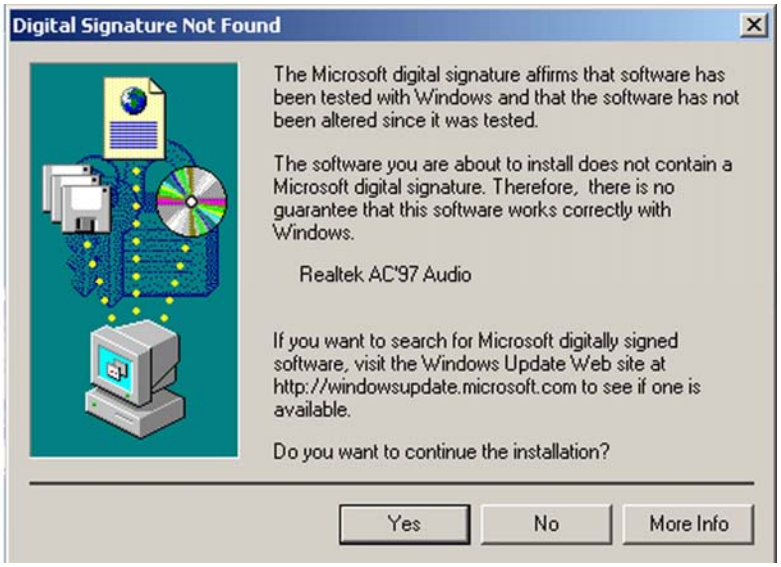

Digital Signature Not Found
The Microsoft digital signature affirms that software has been tested with Windows and that the software has not been altered since it was tested.
The software you are about to install does not contain a Microsoft digital signature. Therefore, there is no guarantee that this software works correctly with Windows.
Realtek AC'97 Audio
If you want to search for Microsoft digitally signed software, visit the Windows Update Web site at http://windowsupdate.microsoft.com to see if one is available.
Do you want to continue the installation?
Yes
No
More Info

Figure 6-10: Audio Driver Digital Signal

Step 6: At this stage the clicking the "**YES**" button in **Figure 6-10** appears, the installation of the driver begins. See **Figure 6-11**.

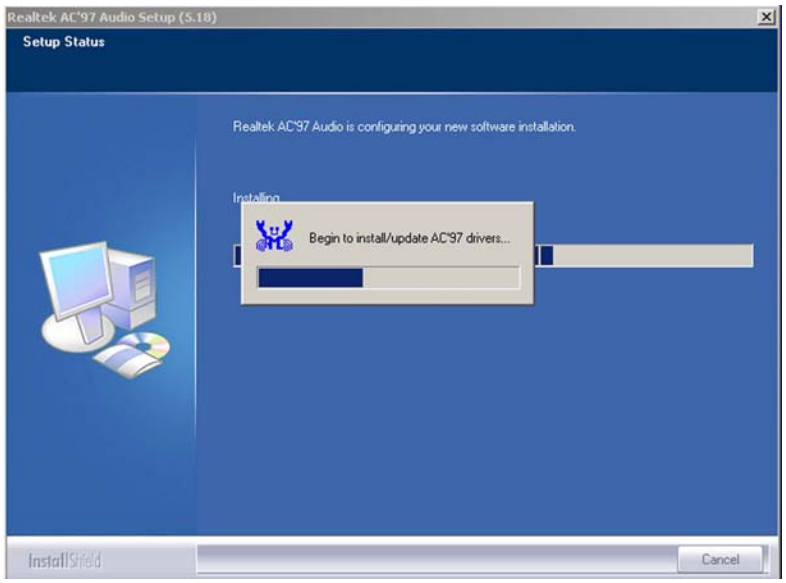


Figure 6-11: Audio Driver Installation Begins

Step 7: After the driver installation process is complete, a confirmation screen shown in **Figure 6-12** appears

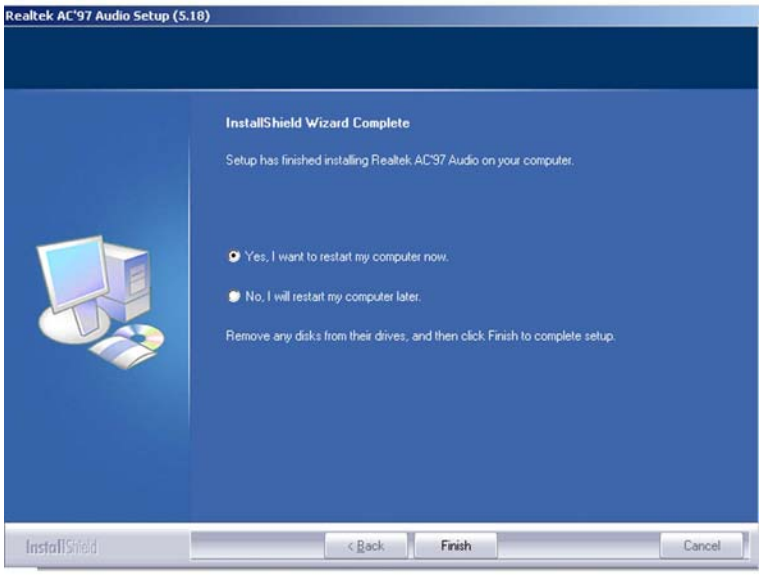

Realtek AC'97 Audio Setup (5.18)
InstallShield Wizard Complete
Setup has finished installing Realtek AC'97 Audio on your computer.
Yes, I want to restart my computer now.
No, I will restart my computer later.
Remove any disks from their drives, and then click Finish to complete setup.
InstallShield
< Back
Finish
Cancel

Figure 6-12: Audio Driver Installation Complete

Step 8: The confirmation screen shown in **Figure 6-12** allows the user to restart the computer immediately after the installation is complete or to restart the computer later. For the settings to take effect the computer must be restarted. Once decided, click the "**FINISH**" button.

6.4 Intel Graphics Media Accelerator Driver

To install the GMA driver, please follow the steps below:

Step 1: Insert the CD into the CD drive connected with the embedded system. Open the CD folder and locate the icon for the **Setup** installation file. Once located, use the mouse to move the cursor over the icon and double click the mouse button.

Step 2: A **Welcome** screen shown in **Figure 6-13** appears by double clicking the **Setup** icon.

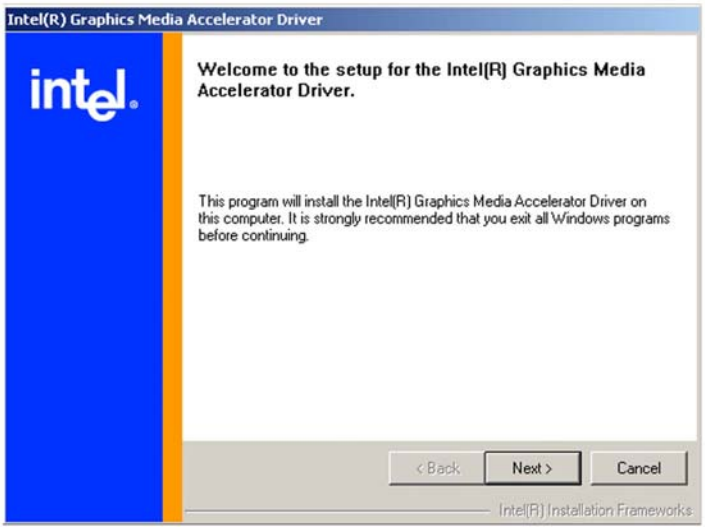

Intel(R) Graphics Media Accelerator Driver
intel
Welcome to the setup for the Intel(R) Graphics Media Accelerator Driver.
This program will install the Intel(R) Graphics Media Accelerator Driver on this computer. It is strongly recommended that you exit all Windows programs before continuing.
< Back
Next >
Cancel
Intel(R) Installation Frameworks

Figure 6-13: GMA Driver Installation Welcome Screen

Step 3: To continue installing click "**Next**" and a license agreement shown in **Figure 6-14** appears. Read through the license agreement.

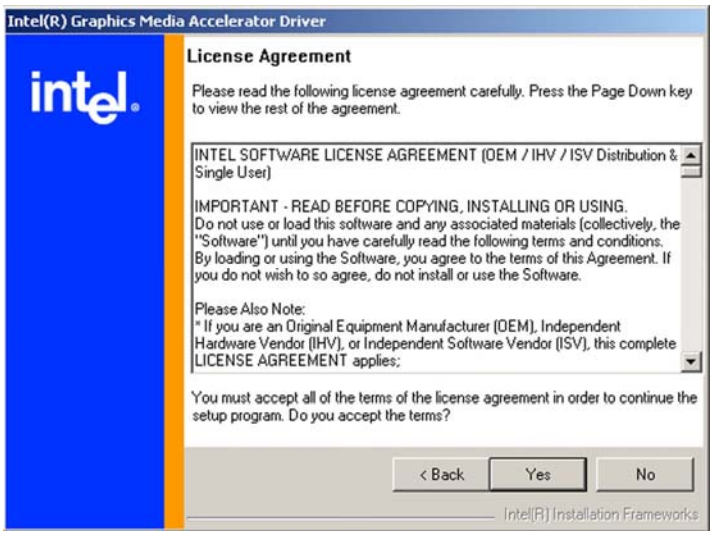

Intel(R) Graphics Media Accelerator Driver
intel
License Agreement
Please read the following license agreement carefully. Press the Page Down key to view the rest of the agreement.
INTEL SOFTWARE LICENSE AGREEMENT (OEM / IHV / ISV Distribution & Single User)
IMPORTANT - READ BEFORE COPYING, INSTALLING OR USING.
Do not use or load this software and any associated materials (collectively, the "Software") until you have carefully read the following terms and conditions. By loading or using the Software, you agree to the terms of this Agreement. If you do not wish to so agree, do not install or use the Software.
Please Also Note:
* If you are an Original Equipment Manufacturer (OEM), Independent Hardware Vendor (IHV), or Independent Software Vendor (ISV), this complete LICENSE AGREEMENT applies;
You must accept all of the terms of the license agreement in order to continue the setup program. Do you accept the terms?
< Back
Yes
No
Intel(R) Installation Frameworks

Figure 6-14: GMA Driver License Agreement

Step 4: Accept the terms and conditions stipulated in the license agreement shown **Figure 6-14** by clicking the "**YES**" button. The installation notice shown in **Figure 6-15** appears.

Figure 6-15: GMA Driver Installing Notice

Step 5: After the driver installation process is complete, a confirmation screen shown in **Figure 6-16** appears.

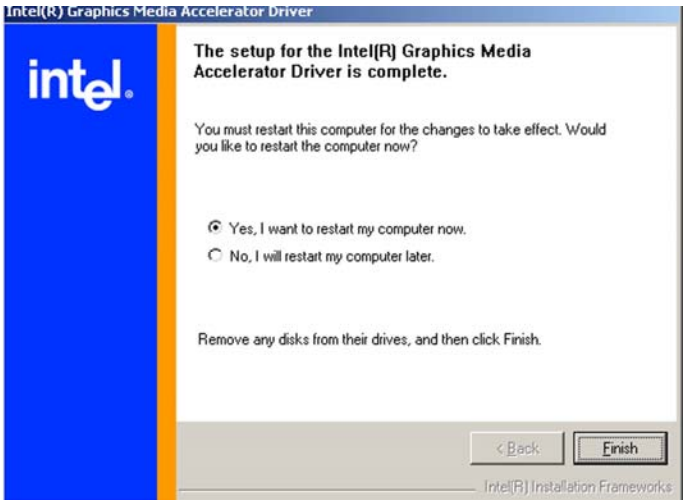

Intel(R) Graphics Media Accelerator Driver
intel
The setup for the Intel(R) Graphics Media Accelerator Driver is complete.
You must restart this computer for the changes to take effect. Would you like to restart the computer now?
Yes, I want to restart my computer now.
No, I will restart my computer later.
Remove any disks from their drives, and then click Finish.
< Back
Finish
Intel(R) Installation Frameworks

Figure 6-16: GMA Driver Installation Complete

Step 6: The confirmation screen shown in **Figure 6-16** allows the user to restart the computer immediately after the installation is complete or to restart the computer later. For the settings to take effect the computer must be restarted. Once decided, click the "**FINISH**" button.

6.5 LAN Driver Installation

To install the LAN driver, please follow the steps below:

Step 1: Insert the CD into the CD drive connected with the embedded system. Open the **LAN** directory and locate the icon for the relevant **Setup** installation file. Once

located, use the mouse to move the cursor over the icon and double click the mouse button.

Step 2: A **LAN License Agreement** screen shown in **Figure 6-18** appears.

DriverInstaller - InstallShield Wizard
License Agreement
Please read the following license agreement carefully.
INTEL SOFTWARE LICENSE AGREEMENT
IMPORTANT - READ BEFORE COPYING, INSTALLING OR USING.
Do not use or load this software and any associated materials (collectively, the "Software") until you have carefully read the following terms and conditions. By loading or using the Software, you agree to the terms of this Agreement. If you do not wish to so agree, do not install or use the Software.
I accept the terms in the license agreement
I do not accept the terms in the license agreement
InstallShield
< Back
Next >
Cancel

Figure 6-17: LAN License Agreement

Step 3: Accept the terms by clicking "**Next**." You are then prompted for the directory the driver is stored in. (See **Figure 6-18**)

DriverInstaller - InstallShield Wizard
Location to Save Files
Where would you like to save your files?
Please enter the folder where you want these files saved. If the folder does not exist, it will be created for you. To continue, click Next.
Save files in folder:
c:\IntelPRO
Change...
InstallShield
< Back
Next >
Cancel

Figure 6-18: Select the Driver Directory

Step 4: After selecting the directory the driver is installed in, click "**Next**." The screen in **Figure 6-19** appears.

Figure 6-19: LAN Driver Configuration

Step 5: In **Figure 6-19**, there are three options.

- Install Base Driver → Installs the base driver
- Make Driver Disk → Copies the driver to disk
- View Release Notes → Opens word document of the release notes

Chapter

7

Troubleshooting and Maintenance

WARNING:

Take Anti-Static precautions whenever maintenance is being carried out on the system components. Failure to take anti-static precautions can cause permanent system damage. For more details on anti-static precautions, please refer to **Section 4.1**.

7.1 IBX-650B System Maintenance Overview

NOTE:

When doing maintenance operations on the system, please follow the instructions in this chapter. Failure to follow these instructions may lead to personal injury and system damage.

To preserve the working integrity of the IBX-650B embedded system, the system must be properly maintained. If embedded system components need replacement, the proper maintenance procedures must be followed to ensure the system can continue to operate normally.

7.2 System Troubleshooting

This section provides some simple troubleshooting suggestions.

7.2.1 The System Doesn't Turn On

If after turning the system on, there is no power (indicated by the power button on the front panel not turning on) please do the following:

Step 1: Check that the power cable connector is properly connected to the terminal block or power socket on the system front panel.

Step 2: Check that the power cable connector is properly plugged into the power source.

Step 3: Make sure the power button is turned on.

Step 4: Plug the system into a monitor and check to see if anything appears on the screen. If the boot-up screen appears it means the power LED has become disconnected. To fix this problem, open the top cover and reconnect the power LED to the motherboard.

If the above steps have been completed and the system still doesn't turn on, please do the following.

Step 1: Open the top cover (**Section 4.2.3**)

Step 2: Check the terminal block/power socket power cable connector is properly connected to the power module.

Step 3: Check that the power button cable connector is properly connected to the motherboard.

Step 4: Make sure the cable connecting to the terminal block/power socket are properly attached and have not become separated.

Step 5: Make sure the cable connecting the power button to the motherboard is still properly attached to the power button and has not been separated.

7.2.2 The System Doesn't Boot Up

If the system doesn't boot up please do the following:

Step 1: Check the power is turned on. See **Section 7.2.1** above.

Step 2: Make sure the SO-DIMM module is properly installed.

Step 3: Reset the system using the reset CMOS jumper.

7.2.3 More Troubleshooting

- ***Nothing appears on the monitor after booting up the system***: Make sure the monitor is properly connected to the system and the monitor is connected to a power supply and turned on.

WARNING!

If all troubleshooting measures have been taken and the system still fails to start, contact the IEI reseller or vendor you purchased the IBX-650B from or contact an IEI sales representative directly. To contact an IEI sales representative, please send an email to sales@iei.com.tw.

7.3 Component Replacement Procedure

WARNING!

Users are not advised to attempt to repair or replace any internal or external components of the IBX-650B embedded system other than those listed below. If any other components fail or need replacement, contact the IEI reseller or vendor you purchased the IBX-650B from or contact an IEI sales representative directly. To contact an IEI sales representative, please send an email to sales@iei.com.tw.

The embedded system components listed below can all be replaced if they fail:

- SO-DIMM module
- Internal hard disk drive (see **Section 4.2.5**)

7.3.1 SO-DIMM Replacement

WARNING:

Using incorrectly specified SO-DIMM may cause permanently damage the IBX-650B. Please make sure the purchased SO-DIMM complies with the memory specifications of the IBX-650B.

To replace a SO-DIMM memory module into a SO-DIMM socket, please follow the steps below.

Step 1: **Locate the SO-DIMM socket.** Place the IBX-650B on an anti-static pad with the bottom panel facing up.

Step 2: **Remove the SO-DIMM access panel** on the bottom surface by removing the retention screw (**Figure 7-1**).

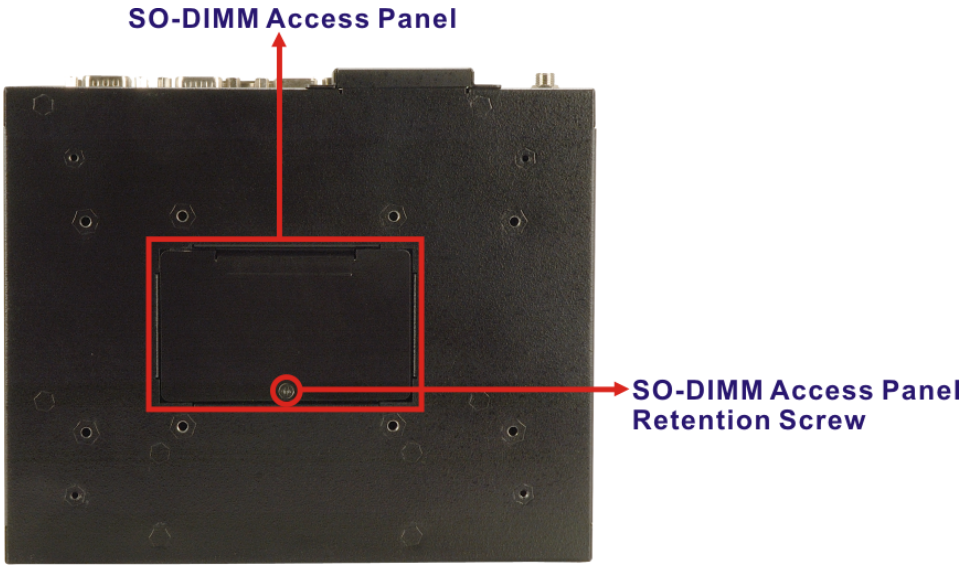


Figure 7-1: SO-DIMM Access Panel

Step 3: **Remove the SO-DIMM** by releasing the arms on the SO-DIMM socket.

Step 4: **Align the new SO-DIMM with the socket**. The SO-DIMM must be oriented in such a way that the notch in the middle of the SO-DIMM must be aligned with the plastic bridge in the socket.

Step 5: **Insert the SO-DIMM**. Push the SO-DIMM chip into the socket at an angle. (See **Figure 7-2**)

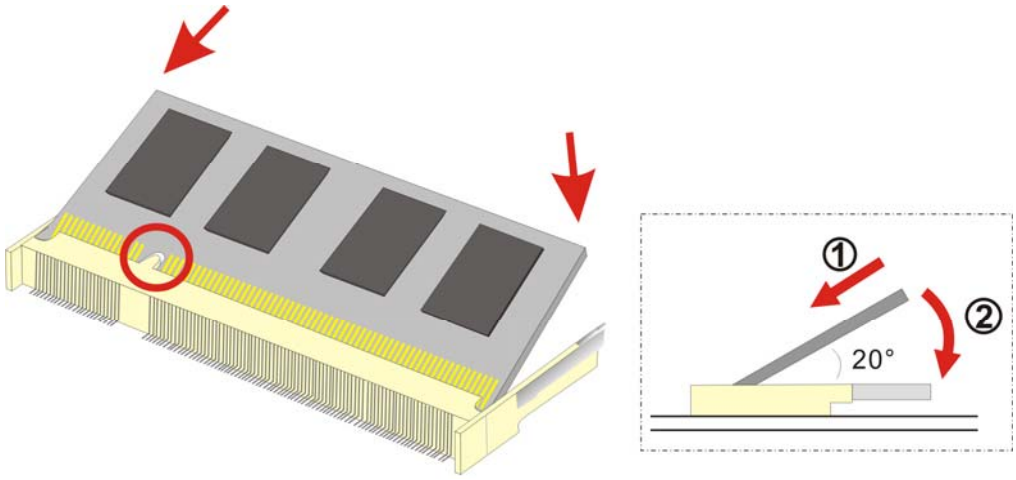


Figure 7-2: SO-DIMM Installation

Step 6: **Open the SO-DIMM socket arms**. Gently pull the arms of the SO-DIMM socket out and push the rear of the SO-DIMM down. (See **Figure 7-2**)

Step 7: **Secure the SO-DIMM**. Release the arms on the SO-DIMM socket. They clip into place and secure the SO-DIMM in the socket.

Appendix

A

One Key Recovery

A.1 One Key Recovery Introduction

The IEI one key recovery is an easy-to-use front end for the Norton Ghost system backup and recovery tool. The one key recovery provides quick and easy shortcuts for creating a backup and reverting to that backup or for reverting to the factory default settings.

The IEI One Key Recovery tool menu is shown below.

Figure A-1: IEI One Key Recovery Tool Menu

Prior to using the IEI One Key Recovery tool (as shown in **Figure A-1**) to backup or restore Windows system, five setup procedures are required.

1. Hardware and BIOS setup (see **Section A.2.1**)
2. Create partitions (see **Section A.2.2**)
3. Install operating system, drivers and system applications (see **Section A.2.3**)
4. Build-up recovery partition (see **Section A.2.4**)
5. Create factory default image (see **Section A.2.5**)

After completing the five initial setup procedures as described above, users can access the recovery tool by pressing <**F3**> while booting up the system. The detailed information of each function is described in **Section A.4**.

NOTE:

The initial setup procedures for Linux system are described in **Section A.3**.

A.1.1 System Requirement

NOTE:

The recovery CD can only be used with IEI products. The software will fail to run and a warning message will appear when used on non-IEI hardware.

To create the system backup, the main storage device must be split into two partitions (three partitions for Linux). The first partition will be for the operating system, while the second partition will be invisible to the operating system and contain the backup made by the one key recovery software.

The partition created for recovery images must be big enough to contain both the factory default image and the user backup image. The size must be calculated before creating the partitions. Please take the following table as a reference when calculating the size of the partition.

	OS	OS Image after Gh	Compression Ratio

		ost	
Windows® 7	7 GB	5 GB	70%
Windows® XPE	776 MB	560 MB	70%
Windows® CE 6.0	36 MB	28 MB	77%

NOTE:

Specialized tools are required to change the partition size if the operating system is already installed.

A.1.2 Supported Operating System

The recovery CD is compatible with both Microsoft Windows and Linux operating system (OS). The supported OS versions are listed below.

- Microsoft Windows
  - Windows XP (Service Pack 2 or 3 required)
  - Windows Vista
  - Windows 7
  - Windows CE 5.0
  - Windows CE 6.0
  - Windows XP Embedded
- Linux
  - Fedora Core 12 (Constantine)
  - Fedora Core 11 (Leonidas)
  - Fedora Core 10 (Cambridge)
  - Fedora Core 8 (Werewolf)
  - Fedora Core 7 (Moonshine)
  - RedHat RHEL-5.4

- RedHat 9 (Ghirke)
- Ubuntu 8.10 (Intrepid)
- Ubuntu 7.10 (Gutsy)
- Ubuntu 6.10 (Edgy)
- Debian 5.0 (Lenny)
- Debian 4.0 (Etch)
- SuSe 11.2
- SuSe 10.3

NOTE:

Installing unsupported OS versions may cause the recovery tool to fail.

A.2 Setup Procedure for Windows

Prior to using the recovery tool to backup or restore Windows system, a few setup procedures are required.

Step 1: Hardware and BIOS setup (see **Section A.2.1**)

Step 2: Create partitions (see **Section A.2.2**)

Step 3: Install operating system, drivers and system applications (see **Section A.2.3**)

Step 4: Build-up recovery partition (see **Section A.2.4**)

Step 5: Create factory default image (see **Section A.2.5**)

The detailed descriptions are described in the following sections.

NOTE:

The setup procedures described below are for Microsoft Windows operating system users. For Linux system, most setup procedures are the same with Microsoft Windows except for several steps which is described in **Section A.3**.

A.2.1 Hardware and BIOS Setup

Step 1: Make sure the system is powered off and unplugged.

Step 2: Install a hard drive or SSD in the system. An unformatted and unpartitioned disk is recommended.

Step 3: Connect an optical disk drive to the system and insert the recovery CD.

Step 4: Turn on the system.

Step 5: Press the <**DELETE**> key as soon as the system is turned on to enter the BIOS.

Step 6: Select the connected optical disk drive as the 1st boot device. (**Boot → Boot Device Priority → 1st Boot Device**).

Step 7: Save changes and restart the computer. Continue to the next section for instructions on partitioning the internal storage.

A.2.2 Create Partitions

To create the system backup, the main storage device must be split into two partitions (three partitions for Linux). The first partition will be for the operating system, while the second partition will be invisible to the operating system and contain the backup made by the one key recovery software.

Step 1: Put the recovery CD in the optical drive of the system.

Step 2: **Boot the system from recovery CD**. When prompted, press any key to boot from the recovery CD. It will take a while to launch the recovery tool. Please be patient!

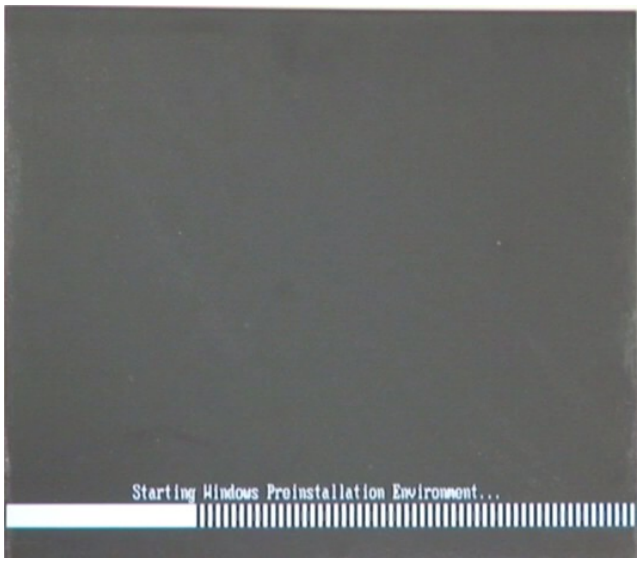


Figure A-2: Launching the Recovery Tool

Step 3: The recovery tool setup menu is shown as below.

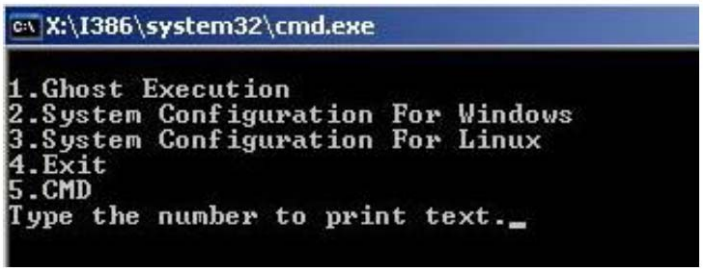


Figure A-3: Recovery Tool Setup Menu

Step 4: Press <**5**> then <Enter>.

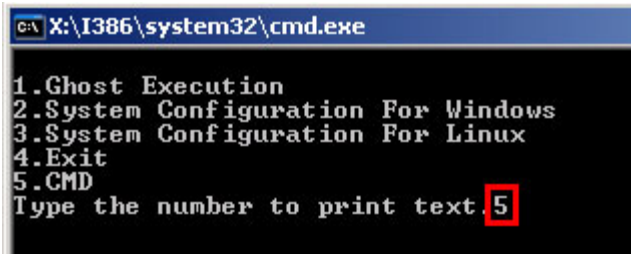


Figure A-4: Command Mode

Step 5: The command prompt window appears. Type the following commands (marked in red) to create two partitions. One is for the OS installation; the other is for saving recovery files and images which will be an invisible partition.

(Press <Enter> after entering each line below)

system32>diskpart

DISKPART>list vol

DISKPART>sel disk 0

DISKPART>create part pri size= ___

DISKPART>assign letter=N

DISKPART>create part pri size= ___

DISKPART>assign letter=F

DISKPART>exit

system32>format N: /fs:ntfs /q /y

system32>format F: /fs:ntfs /q /v:Recovery /y

system32>exit

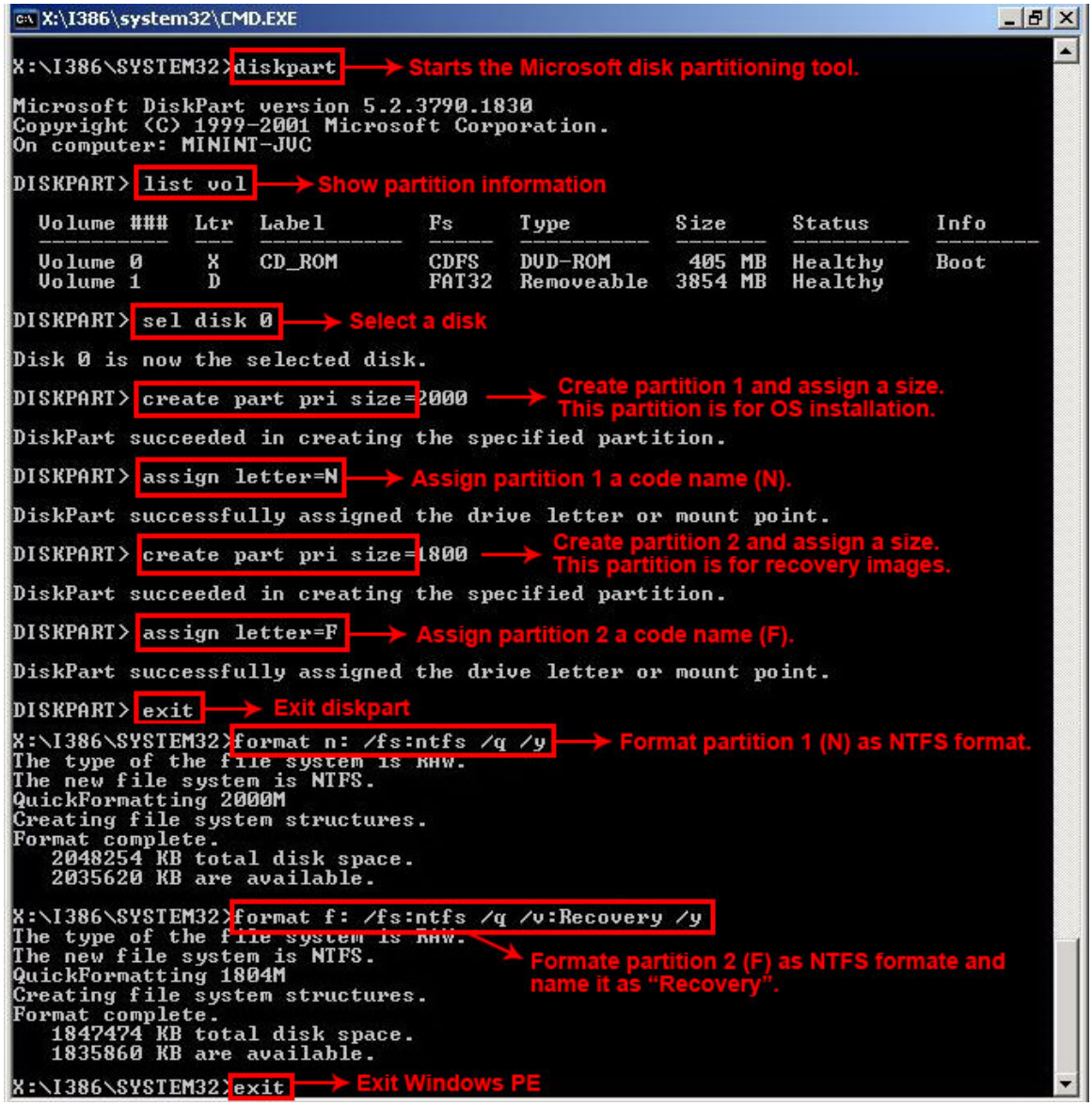
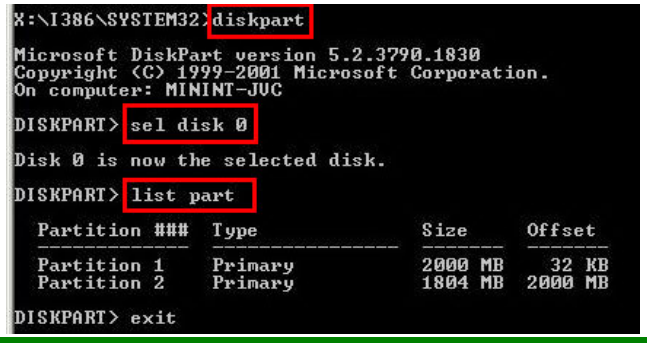

X:\I386\system32\CMD.EXE
X:\I386\SYSTEM32>diskpart
Starts the Microsoft disk partitioning tool.
Microsoft DiskPart version 5.2.3790.1830
Copyright (C) 1999-2001 Microsoft Corporation.
On computer: MININT-JVC
DISKPART> list vol
Show partition information
Volume ### Ltr Label Fs Type Size Status Info
Volume 0 X CD_ROM CDFS DVD-ROM 405 MB Healthy Boot
Volume 1 D FAT32 Removeable 3854 MB Healthy
DISKPART> sel disk 0
Select a disk
Disk 0 is now the selected disk.
DISKPART> create part pri size=2000
Create partition 1 and assign a size.
This partition is for OS installation.
DiskPart succeeded in creating the specified partition.
DISKPART> assign letter=N
Assign partition 1 a code name (N).
DiskPart successfully assigned the drive letter or mount point.
DISKPART> create part pri size=1800
Create partition 2 and assign a size.
This partition is for recovery images.
DiskPart succeeded in creating the specified partition.
DISKPART> assign letter=F
Assign partition 2 a code name (F).
DiskPart successfully assigned the drive letter or mount point.
DISKPART> exit
Exit diskpart
X:\I386\SYSTEM32>format n: /fs:ntfs /q /y
Format partition 1 (N) as NTFS format.
The type of the file system is RAW.
The new file system is NTFS.
QuickFormatting 2000M
Creating file system structures.
Format complete.
2048254 KB total disk space.
2035620 KB are available.
X:\I386\SYSTEM32>format f: /fs:ntfs /q /v:Recovery /y
The type of the file system is RAW.
The new file system is NTFS.
QuickFormatting 1804M
Creating file system structures.
Format complete.
1847474 KB total disk space.
1835860 KB are available.
Formate partition 2 (F) as NTFS formate and
name it as “Recovery”.
X:\I386\SYSTEM32>exit
Exit Windows PE

Figure A-5: Partition Creation Commands

NOTE:

Use the following commands to check if the partitions were created successfully.


X:\I386\SYSTEM32>diskpart
Microsoft DiskPart version 5.2.3790.1830
Copyright (C) 1999-2001 Microsoft Corporation.
On computer: MININT-JVC
DISKPART> sel disk 0
Disk 0 is now the selected disk.
DISKPART> list part
Partition ### Type Size Offset
Partition 1 Primary 2000 MB 32 KB
Partition 2 Primary 1804 MB 2000 MB
DISKPART> exit

Step 6: Press any key to exit the recovery tool and automatically reboot the system.

Please continue to the following procedure: Build-up Recovery Partition.

A.2.3 Install Operating System, Drivers and Applications

Install the operating system onto the unlabelled partition. The partition labeled as "Recovery" is for use by the system recovery tool and should not be used for installing the operating system or any applications.

NOTE:

The operating system installation program may offer to reformat the chosen partition. DO NOT format the partition again. The partition has already been formatted and is ready for installing the new operating system.

To install the operating system, insert the operating system installation CD into the optical drive. Restart the computer and follow the installation instructions.

A.2.4 Build-up Recovery Partition

Step 1: Put the recover CD in the optical drive.

Step 2: Start the system.

Step 3: **Boot the system from recovery CD**. When prompted, press any key to boot from the recovery CD. It will take a while to launch the recovery tool. Please be patient!

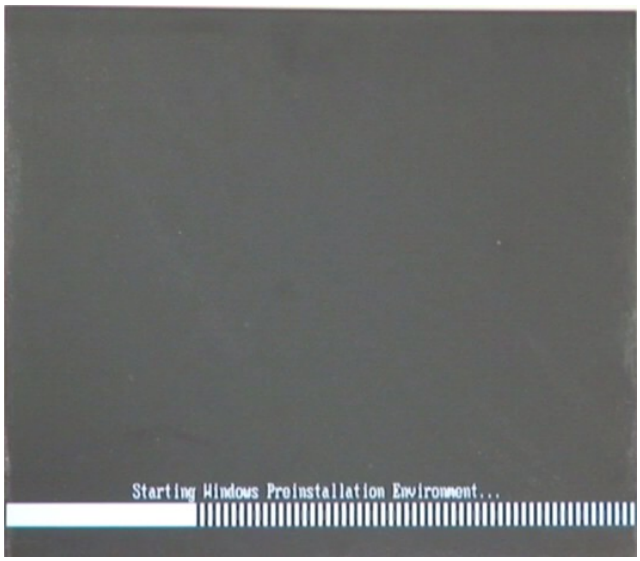


Figure A-6: Launching the Recovery Tool

Step 4: When the recovery tool setup menu appears, press <**2**> then <Enter>.

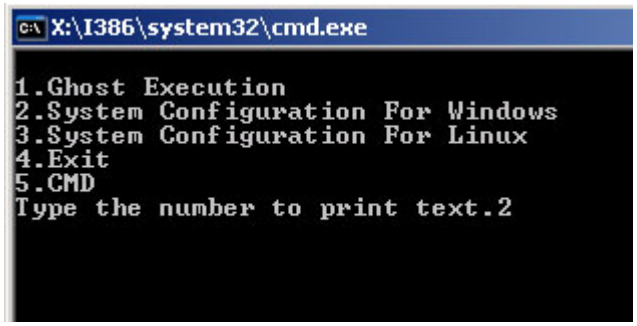


Figure A-7: System Configuration for Windows

Step 5: The Symantec Ghost window appears and starts configuring the system to build-up a recovery partition. In this process, the partition which is created for

recovery files in **Section A.2.2** is hidden and the recovery tool is saved in this partition.

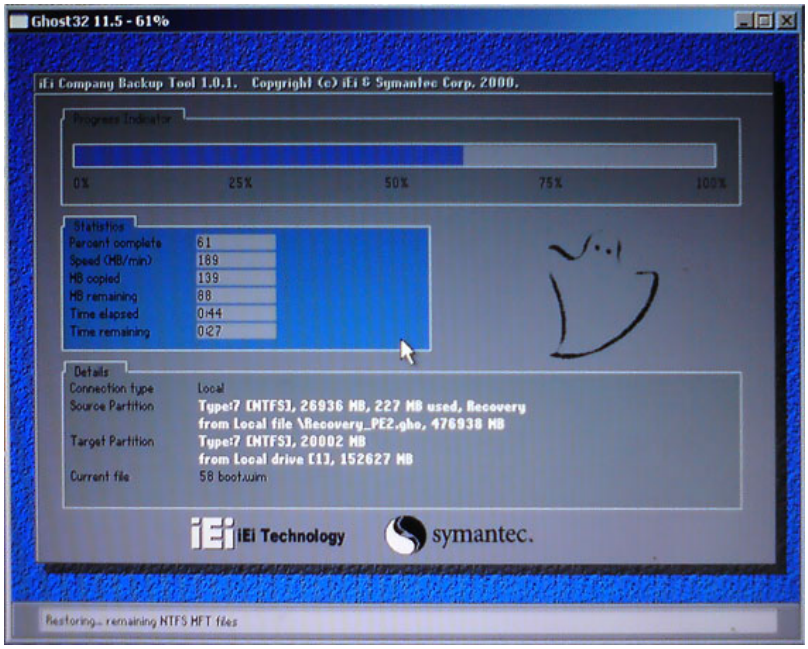


Figure A-8: Build-up Recovery Partition

Step 6: After completing the system configuration, press any key in the following window to reboot the system.

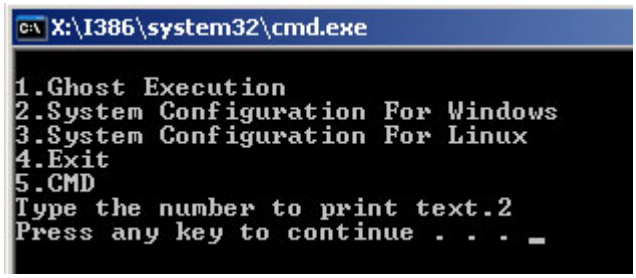


Figure A-9: Press any key to continue

Step 7: Eject the recovery CD.

A.2.5 Create Factory Default Image

NOTE:

Before creating the factory default image, please configure the system to a factory default environment, including driver and application installations.

To create a factory default image, please follow the steps below.

Step 1: Turn on the system. When the following screen displays (**Figure A-10**), press the <**F3**> key to access the recovery tool. The message will display for 10 seconds, please press F3 before the system boots into the operating system.

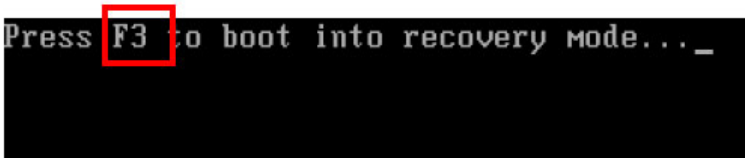


Figure A-10: Press F3 to Boot into Recovery Mode

Step 2: The recovery tool menu appears. Type <**4**> and press <**Enter**>. (**Figure A-11**)

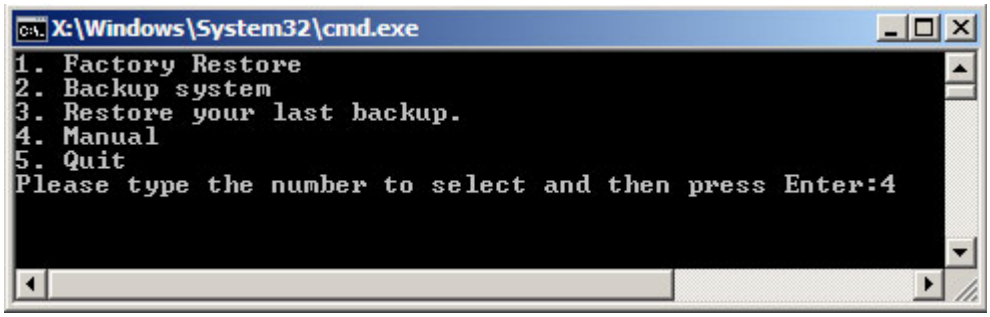


Figure A-11: Recovery Tool Menu

Step 3: The About Symantec Ghost window appears. Click **OK** button to continue.

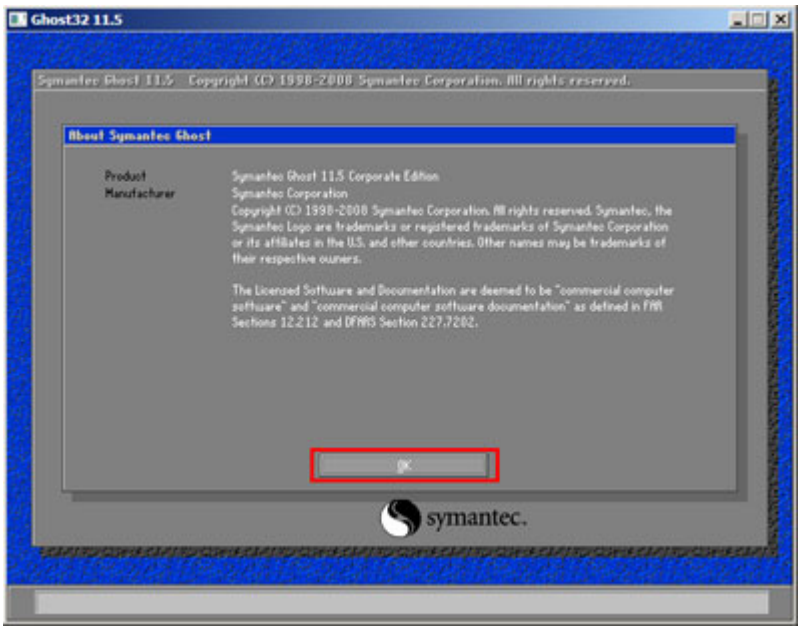


Figure A-12: About Symantec Ghost Window

Step 4: Use mouse to navigate to the option shown below (**Figure A-13**).

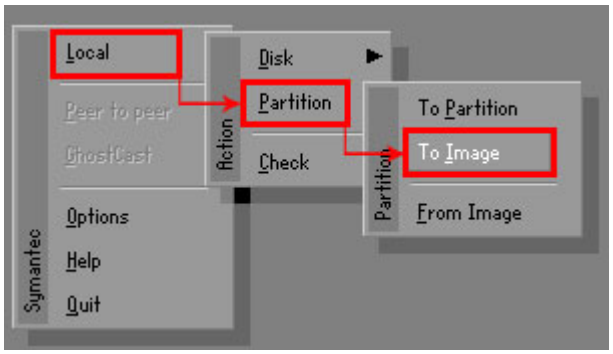


Figure A-13: Symantec Ghost Path

Step 5: Select the local source drive (Drive 1) as shown in **Figure A-14**. Then click OK.

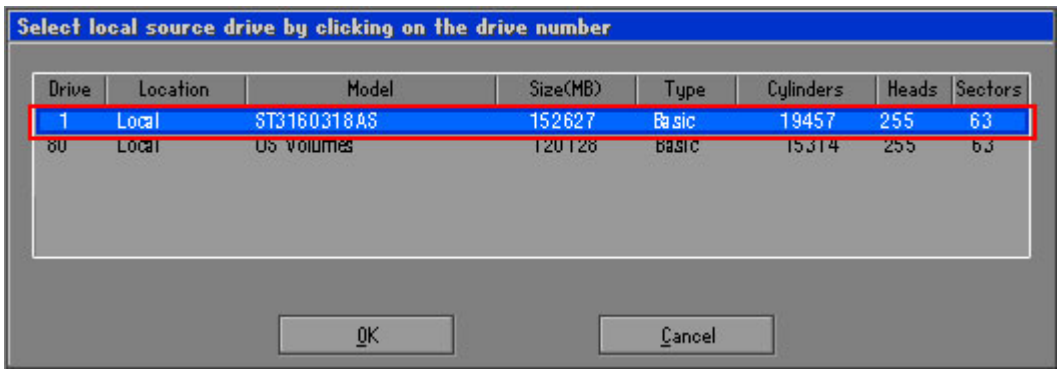


Figure A-14: Select a Local Source Drive

Step 6: Select a source partition (Part 1) from basic drive as shown in **Figure A-15**. Then click OK.

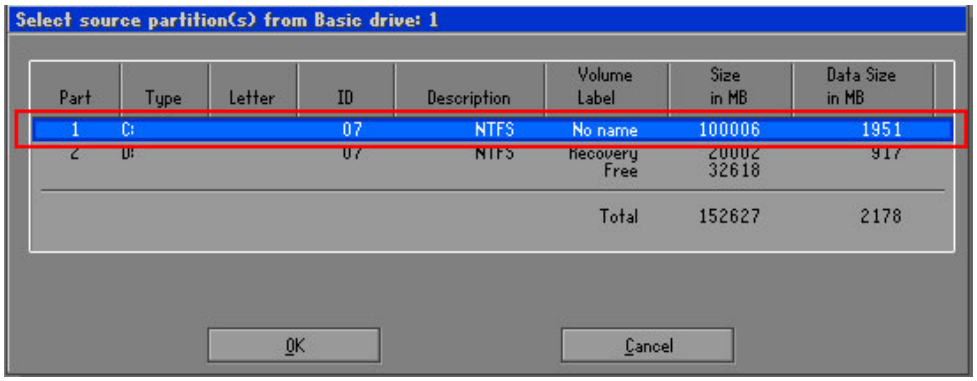


Figure A-15: Select a Source Partition from Basic Drive

Step 7: Select **1.2: [Recovery] NTFS drive** and enter a file name called **iei** (**Figure A-16**). Click **Save**. The factory default image will then be saved in the selected recovery drive and named IEI.GHO.

WARNING:

The file name of the factory default image must be **iei.GHO**.

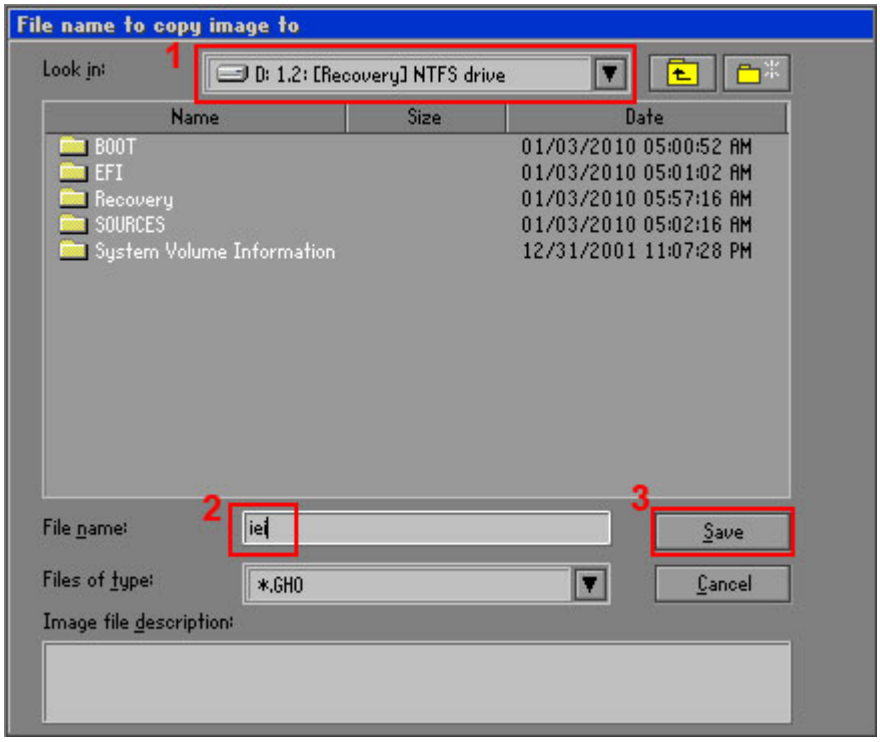


Figure A-16: File Name to Copy Image to

Step 8: When the Compress Image screen in **Figure A-17** prompts, click **High** to make the image file smaller.

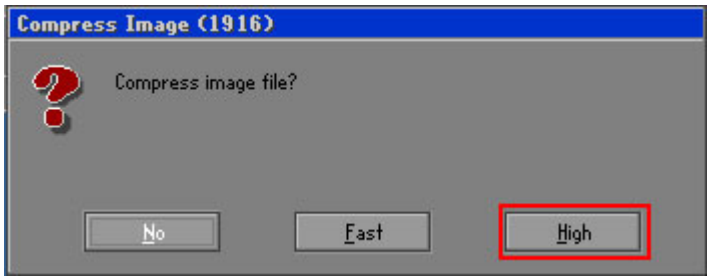


Figure A-17: Compress Image

Step 9: The Proceed with partition image creation window appears, click **Yes** to continue.

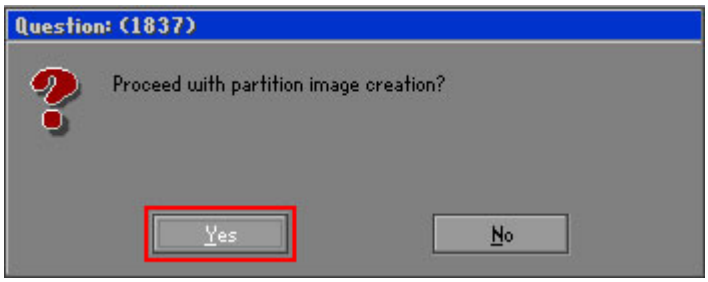


Figure A-18: Image Creation Confirmation

Step 10: The Symantec Ghost starts to create the factory default image (**Figure A-19**).

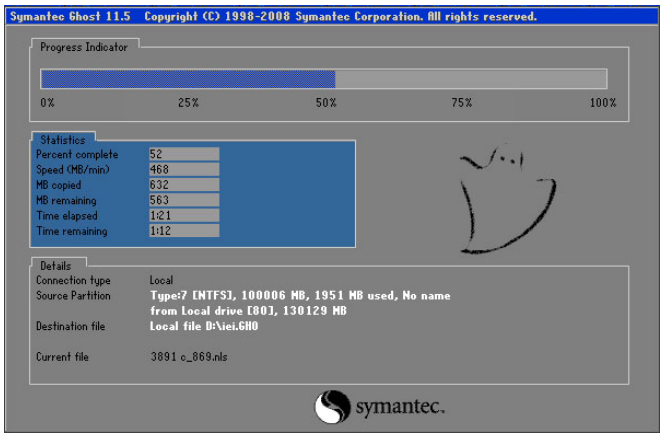


Figure A-19: Image Creation Process

Step 11: When the image creation completes, a screen prompts as shown in **Figure A-20**. Click **Continue** and close the Ghost window to exit the program.

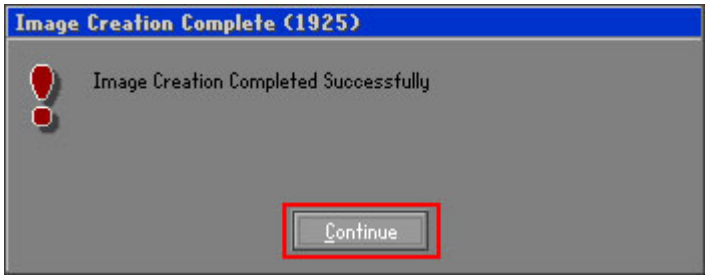


Figure A-20: Image Creation Complete

Step 12: The recovery tool main menu window is shown as below. Press any key to reboot the system.

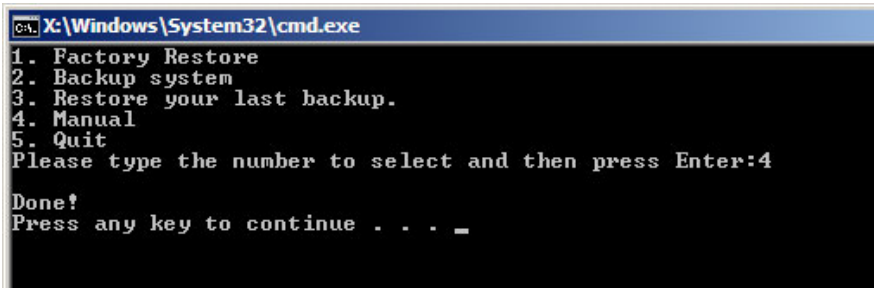


Figure A-21: Press Any Key to Continue

A.3 Setup Procedure for Linux

The initial setup procedures for Linux system are mostly the same with the procedure for Microsoft Windows. Please follow the steps below to setup recovery tool for Linux OS.

Step 1: **Hardware and BIOS setup**. Refer to **Section A.2.1**.

Step 2: **Install Linux operating system**. Make sure to install GRUB (v0.97 or earlier) MBR type and Ext3 partition type. Leave enough space on the hard drive to create the recover partition later.

NOTE:

If the Linux OS is not installed with GRUB (v0.97 or earlier) and Ext3, the Symantec Ghost may not function properly.

While installing Linux OS, please create two partitions:

- Partition 1: ***/***
- Partition 2: **SWAP**

NOTE:

Please reserve enough space for partition 3 for saving recovery images.

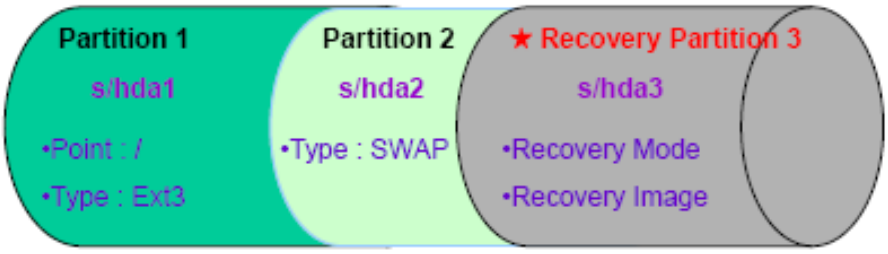


Figure A-22: Partitions for Linux

Step 3: **Create a recovery partition**. Insert the recovery CD into the optical disk drive. Follow **Step 1** ~ **Step 3** described in **Section A.2.2**. Then type the following commands (marked in red) to create a partition for recovery images.

system32>diskpart

DISKPART>list vol

DISKPART>sel disk 0

DISKPART>create part pri size= ___

DISKPART>assign letter=N

DISKPART>exit

system32>format N: /fs:ntfs /q /v:Recovery /y

system32>exit

Step 4: **Build-up recovery partition**. Press any key to boot from the recovery CD. It will take a while to launch the recovery tool. Please be patient. When the recovery tool setup menu appears, type <**3**> and press <Enter> (**Figure A-23**). The Symantec Ghost window appears and starts configuring the system to build-up a recovery partition. After completing the system configuration, press any key to reboot the system. Eject the recovery CD.

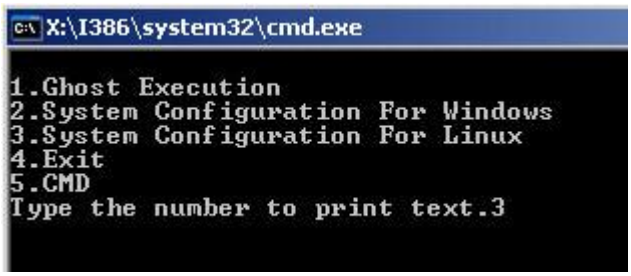


Figure A-23: System Configuration for Linux

Step 5: **Access the recovery tool main menu by modifying the "menu.lst"**. To first access the recovery tool main menu, the menu.lst must be modified. In Linux system, enter Administrator (root). When prompt appears, type:

cd /boot/grub

vi menu.lst

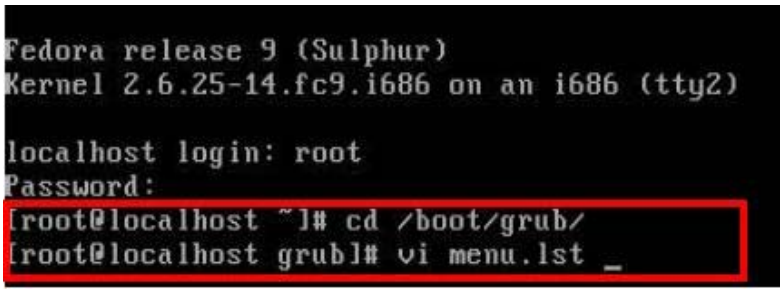
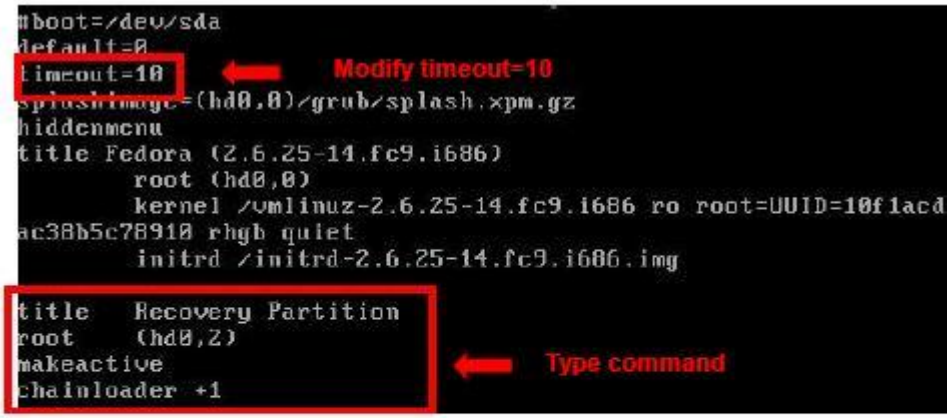


Figure A-24: Access menu.lst in Linux (Text Mode)

Step 6: Modify the menu.lst as shown below.



- Type command:

  title Recovery Partition

  root (hd0,2)

  makeactive

  chainloader +1

Step 7: The recovery tool menu appears. (**Figure A-25**)

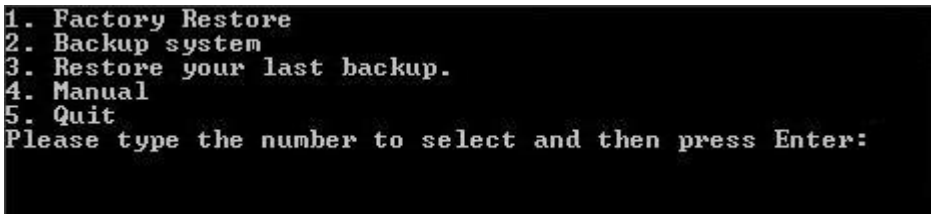

1. Factory Restore
2. Backup system
3. Restore your last backup.
4. Manual
5. Quit
Please type the number to select and then press Enter:

Figure A-25: Recovery Tool Menu

Step 8: **Create a factory default image**. Follow **Step 2** ~ **Step 12** described in **Section A.2.5** to create a factory default image.

A.4 Recovery Tool Functions

After completing the initial setup procedures as described above, users can access the recovery tool by pressing <**F3**> while booting up the system. The main menu of the recovery tool is shown below.

Figure A-26: Recovery Tool Main Menu

The recovery tool has several functions including:

6. **Factory Restore**: Restore the factory default image (iei.GHO) created in **Section A.2.5**.
7. **Backup system**: Create a system backup image (iei_user.GHO) which will be saved in the hidden partition.
8. **Restore your last backup**: Restore the last system backup image
9. **Manual**: Enter the Symantec Ghost window to configure manually.
10. **Quit**: Exit the recovery tool and restart the system.

WARNING:

Please do not turn off the system power during the process of system recovery or backup.

WARNING:

All data in the system will be deleted during the system recovery. Please backup the system files before restoring the system (either Factory Restore or Restore Backup).

A.4.1 Factory Restore

To restore the factory default image, please follow the steps below.

Step 1: Type <**1**> and press <**Enter**> in the main menu.

Step 2: The Symantec Ghost window appears and starts to restore the factory default. A factory default image called **iei.GHO** is created in the hidden Recovery partition.

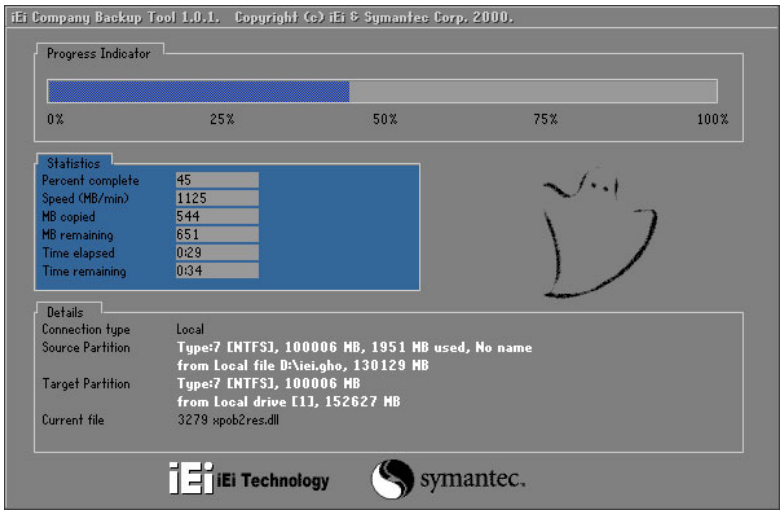


Figure A-27: Restore Factory Default

Step 3: The screen is shown as in **Figure A-28** when completed. Press any key to reboot the system.

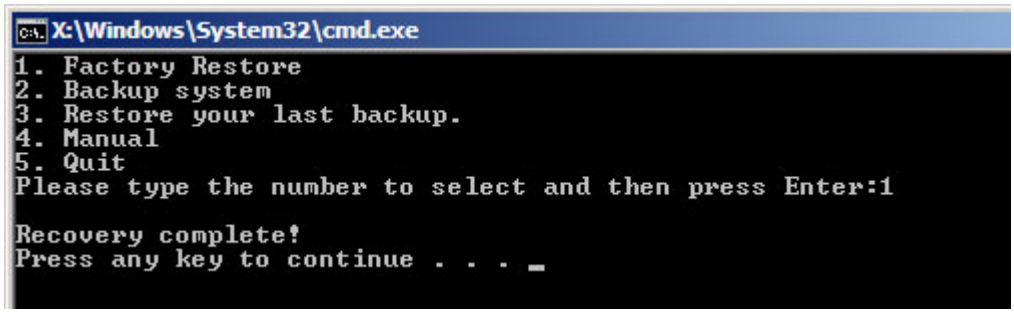

X:\Windows\System32\cmd.exe
1. Factory Restore
2. Backup system
3. Restore your last backup.
4. Manual
5. Quit
Please type the number to select and then press Enter:1
Recovery complete!
Press any key to continue . . .

Figure A-28: Recovery Complete Window

A.4.2 Backup System

To backup the system, please follow the steps below.

Step 1: Type <**2**> and press <**Enter**> in the main menu.

Step 2: The Symantec Ghost window appears and starts to backup the system. A backup image called **iei_user.GHO** is created in the hidden Recovery partition.

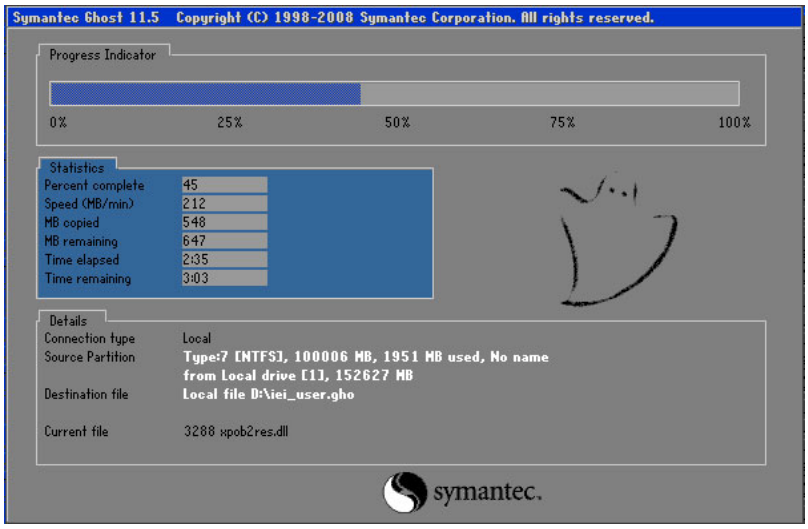


Figure A-29: Backup System

Step 3: The screen is shown as in **Figure A-30** when system backup is completed. Press any key to reboot the system.

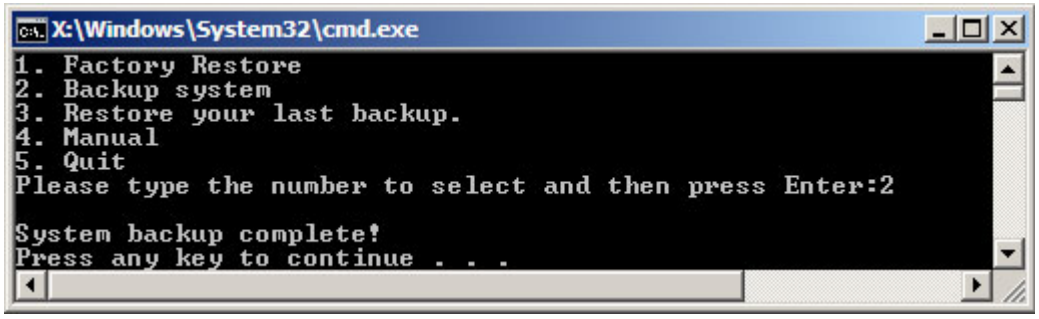

X:\Windows\System32\cmd.exe
1. Factory Restore
2. Backup system
3. Restore your last backup.
4. Manual
5. Quit
Please type the number to select and then press Enter:2
System backup complete!
Press any key to continue . . .

Figure A-30: System Backup Complete Window

A.4.3 Restore Your Last Backup

To restore the last system backup, please follow the steps below.

Step 1: Type <**3**> and press <**Enter**> in the main menu.

Step 2: The Symantec Ghost window appears and starts to restore the last backup image (iei_user.GHO).

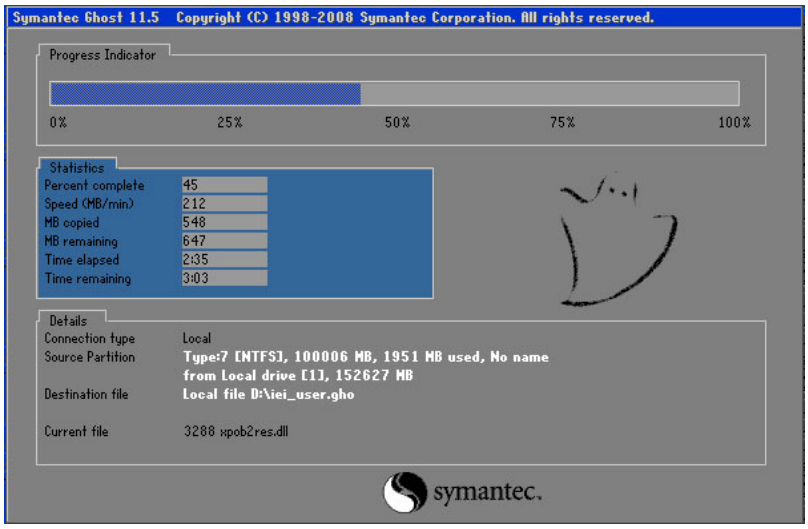


Figure A-31: Restore Backup

Step 3: The screen is shown as in **Figure A-32** when backup recovery is completed. Press any key to reboot the system.

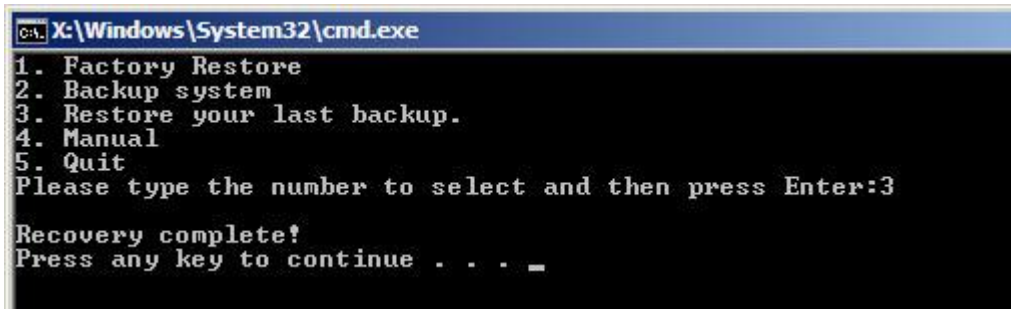

X:\Windows\System32\cmd.exe
1. Factory Restore
2. Backup system
3. Restore your last backup.
4. Manual
5. Quit
Please type the number to select and then press Enter:3
Recovery complete!
Press any key to continue . . .

Figure A-32: Restore System Backup Complete Window

A.4.4 Manual

To restore the last system backup, please follow the steps below.

Step 1: Type <**4**> and press <**Enter**> in the main menu.

Step 2: The Symantec Ghost window appears. Use the Ghost program to backup or recover the system manually.

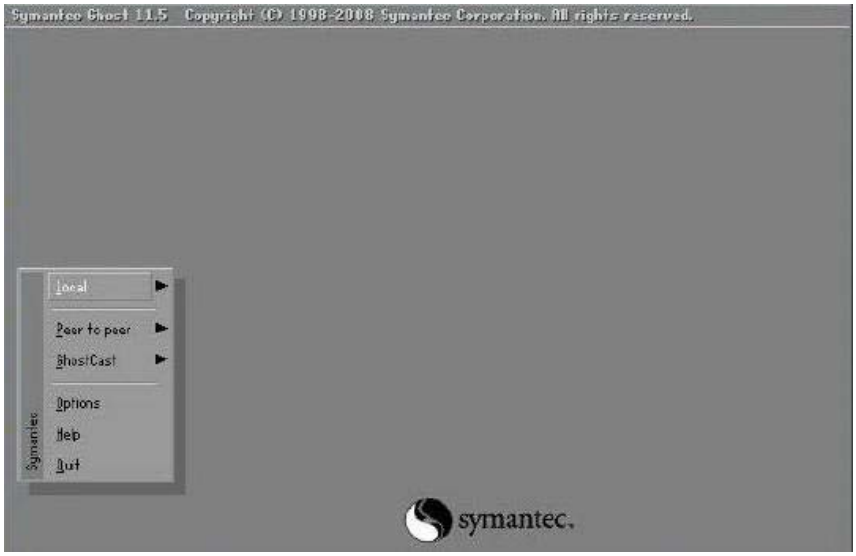


Figure A-33: Symantec Ghost Window

Step 3: When backup or recovery is completed, press any key to reboot the system.

A.5 Other Information

A.5.1 Using AHCI Mode or ALi M5283 / VIA VT6421A Controller

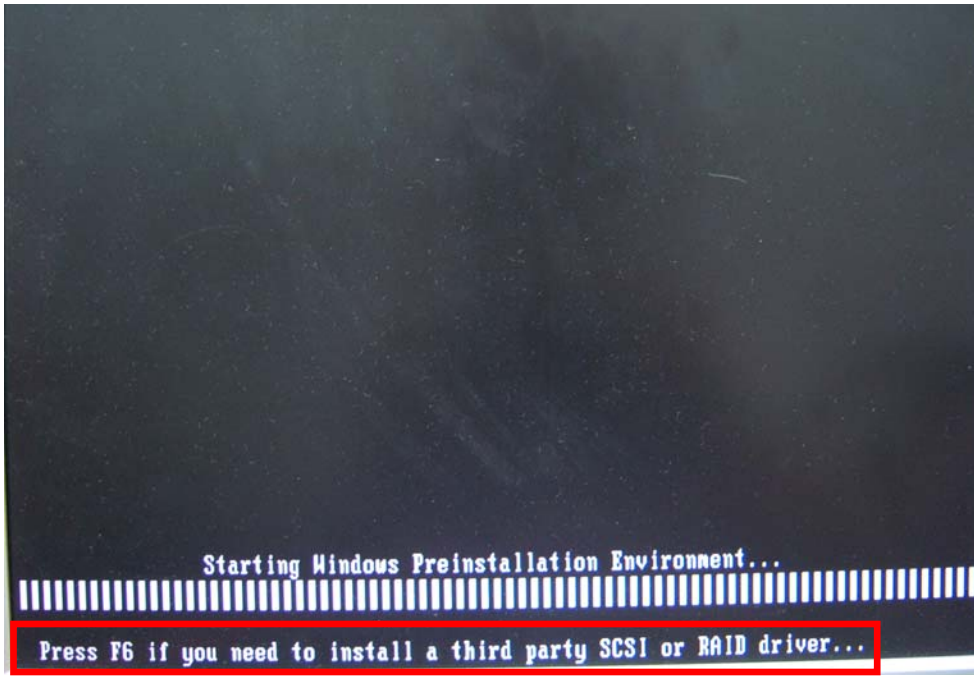
When the system uses AHCI mode or some specific SATA controllers such as ALi M5283 or VIA VT6421A, the SATA RAID/AHCI driver must be installed before using one key recovery. Please follow the steps below to install the SATA RAID/AHCI driver.

Step 1: Copy the SATA RAID/AHCI driver to a floppy disk and insert the floppy disk into a USB floppy disk drive. The SATA RAID/AHCI driver must be especially designed for the on-board SATA controller.

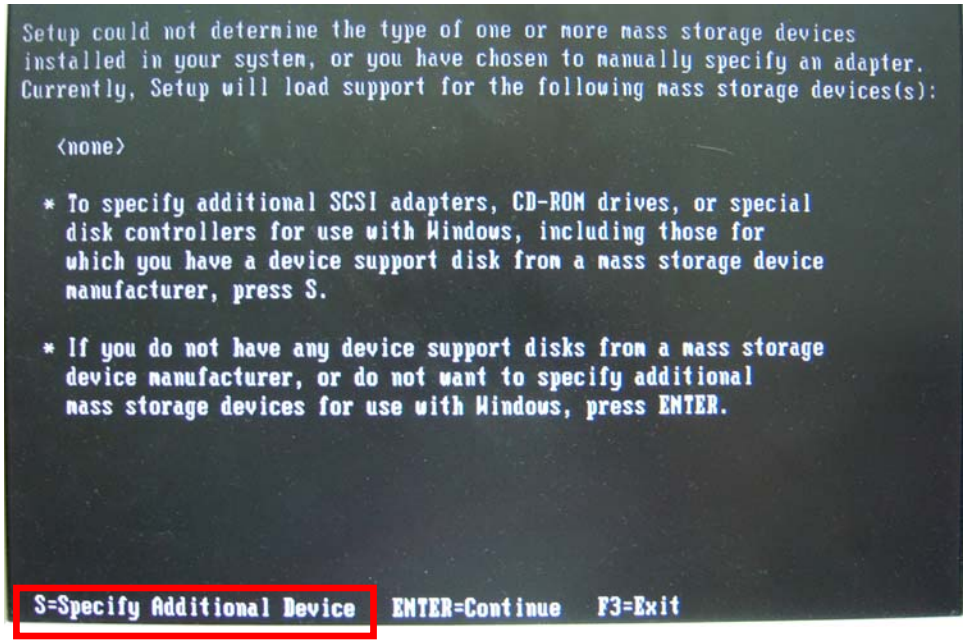
Step 2: Connect the USB floppy disk drive to the system.

Step 3: Insert the One Key Recovery CD into the system and boot the system from the CD.

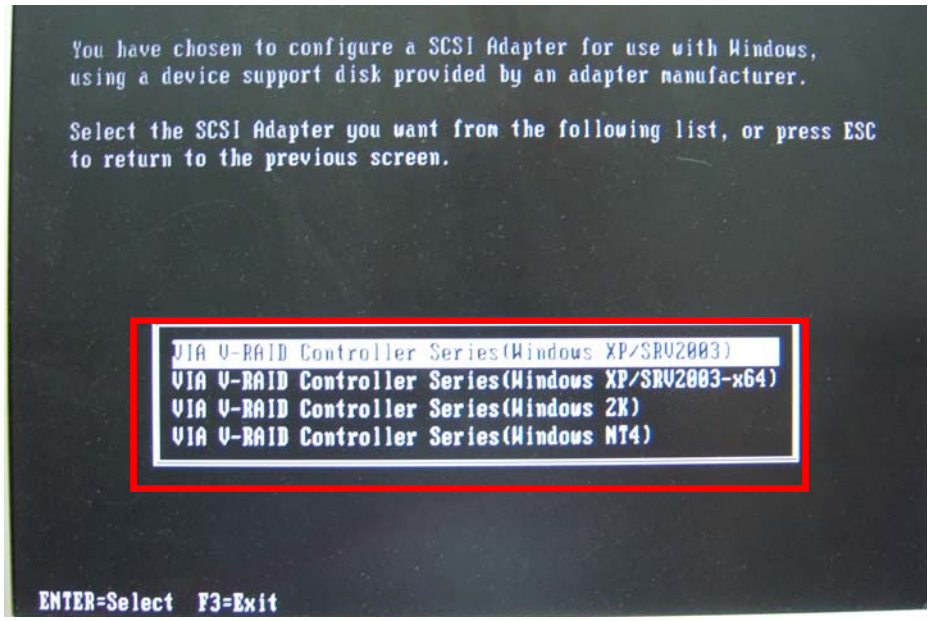
Step 4: When launching the recovery tool, press <**F6**>.



Step 5: When the following window appears, press <**S**> to select “Specify Additional Device”.


Setup could not determine the type of one or more mass storage devices installed in your system, or you have chosen to manually specify an adapter.
Currently, Setup will load support for the following mass storage devices(s):
<none>
* To specify additional SCSI adapters, CD-ROM drives, or special disk controllers for use with Windows, including those for which you have a device support disk from a mass storage device manufacturer, press S.
* If you do not have any device support disks from a mass storage device manufacturer, or do not want to specify additional mass storage devices for use with Windows, press ENTER.
S=Specify Additional Device
ENTER=Continue
F3=Exit

Step 6: In the following window, select a SATA controller mode used in the system. Then press <**Enter**>. The user can now start using the SATA HDD.


You have chosen to configure a SCSI Adapter for use with Windows, using a device support disk provided by an adapter manufacturer.
Select the SCSI Adapter you want from the following list, or press ESC to return to the previous screen.
VIA V-RAID Controller Series(Windows XP/SRV2003)
VIA V-RAID Controller Series(Windows XP/SRV2003-x64)
VIA V-RAID Controller Series(Windows 2K)
VIA V-RAID Controller Series(Windows NT4)
ENTER=Select
F3=Exit

Step 7: After pressing <Enter>, the system will get into the recovery tool setup menu. Continue to follow the setup procedure from **Step 4** in **Section A.2.2 Create Partitions** to finish the whole setup process.

A.5.2 System Memory Requirement

To be able to access the recovery tool by pressing <**F3**> while booting up the system, please make sure to have enough system memory. The minimum memory requirement is listed below.

- **Using Award BIOS**: 128 MB system memory
- **Using AMI BIOS**: 512 MB system memory.

Chapter

B

BIOS Menu Options

B.1 BIOS Configuration Options

Below is a list of BIOS configuration options described in **Chapter 5**.

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Appendix

C

Watchdog Timer

NOTE:

The following discussion applies to DOS environment. IEI support is contacted or the IEI website visited for specific drivers for more sophisticated operating systems, e.g., Windows and Linux.

The Watchdog Timer is provided to ensure that standalone systems can always recover from catastrophic conditions that cause the CPU to crash. This condition may have occurred by external EMI or a software bug. When the CPU stops working correctly, Watchdog Timer either performs a hardware reset (cold boot) or a Non-Maskable Interrupt (NMI) to bring the system back to a known state.

A BIOS function call (INT 15H) is used to control the Watchdog Timer:

INT 15H:

AH – 6FH Sub-function:	
AL – 2:	Sets the Watchdog Timer's period.
BL:	Time-out value (Its unit-second is dependent on the item "Watchdog Timer unit select" in CMOS setup).

Table C-1: AH-6FH Sub-function

Call sub-function 2 to set the time-out period of Watchdog Timer first. If the time-out value is not zero, the Watchdog Timer starts counting down. While the timer value reaches zero, the system resets. To ensure that this reset condition does not occur, calling sub-function 2 must periodically refresh the Watchdog Timer. However, the Watchdog timer is disabled if the time-out value is set to zero.

A tolerance of at least 10% must be maintained to avoid unknown routines within the operating system (DOS), such as disk I/O that can be very time-consuming.

NOTE:

When exiting a program it is necessary to disable the Watchdog Timer, otherwise the system resets.

Example program:

```
; INITIAL TIMER PERIOD COUNTER
;
W_LOOP:

        MOV     AX, 6F02H       ;setting the time-out value
        MOV     BL, 30          ;time-out value is 48 seconds
        INT      15H
 ;
; ADD THE APPLICATION PROGRAM HERE
;
        CMP      EXIT_AP, 1     ;is the application over?
        JNE      W_LOOP         ;No, restart the application

        MOV     AX, 6F02H       ;disable Watchdog Timer
        MOV     BL, 0           ;
        INT      15H
;
; EXIT ;
```

Appendix

D

Hazardous Materials Disclosure

D.1 Hazardous Material Disclosure Table for IPB Products Certified as RoHS Compliant Under 2002/95/EC Without Mercury

The details provided in this appendix are to ensure that the product is compliant with the Peoples Republic of China (China) RoHS standards. The table below acknowledges the presences of small quantities of certain materials in the product, and is applicable to China RoHS only.

A label will be placed on each product to indicate the estimated “Environmentally Friendly Use Period” (EFUP). This is an estimate of the number of years that these substances would “not leak out or undergo abrupt change.” This product may contain replaceable sub-assemblies/components which have a shorter EFUP such as batteries and lamps. These components will be separately marked.

Please refer to the table on the next page.

Part Name	Toxic or Hazardous Substances and Elements					
	Lead (Pb)	Mercury (Hg)	Cadmium (Cd)	Hexavalent Chromium (CR(VI))	Polybrominated Biphenyls (PBB)	Polybrominated Diphenyl Ethers (PBDE)
Housing	X	O	O	O	O	X
Display	X	O	O	O	O	X
Printed Circuit Board	X	O	O	O	O	X
Metal Fasteners	X	O	O	O	O	O
Cable Assembly	X	O	O	O	O	X
Fan Assembly	X	O	O	O	O	X
Power Supply Assemblies	X	O	O	O	O	X
Battery	O	O	O	O	O	O

O: This toxic or hazardous substance is contained in all of the homogeneous materials for the part is below the limit requirement in SJ/T11363-2006

X: This toxic or hazardous substance is contained in at least one of the homogeneous materials for this part is above the limit requirement in SJ/T11363-2006

此附件旨在确保本产品符合中国 RoHS 标准。以下表格标示此产品中某有毒物质的含量符合中国 RoHS 标准规定的限量要求。

本产品上会附有"环境友好使用期限"的标签，此期限是估算这些物质"不会有泄漏或突变"的年限。本产品可能包含有较短的环境友好使用期限的可替换元件，像是电池或灯管，这些元件将会单独标示出来。

部件名称	有毒有害物质或元素					
	铅 (Pb)	汞 (Hg)	镉 (Cd)	六价铬 (CR(VI))	多溴联苯 (PBB)	多溴二苯醚 (PBDE)
壳体	X	O	O	O	O	X
显示	X	O	O	O	O	X
印刷电路板	X	O	O	O	O	X
金属螺帽	X	O	O	O	O	O
电缆组装	X	O	O	O	O	X
风扇组装	X	O	O	O	O	X
电力供应组装	X	O	O	O	O	X
电池	O	O	O	O	O	O

O: 表示该有毒有害物质在该部件所有物质材料中的含量均在 SJ/T11363-2006 标准规定的限量要求以下。

X: 表示该有毒有害物质至少在该部件的某一均质材料中的含量超出 SJ/T11363-2006 标准规定的限量要求。